

608129

Loans Raised in India :

- ✓ 33. Return of all Loans raised in India chargeable on the Revenues of India, outstanding at the commencement of the half-year ending on 30th September 1876, with Rates of Interest payable thereon, and Date of the Termination of each Debt incurred during the half-year, Moneys raised thereby, Loans paid off and outstanding at the close of the half-year, &c. - - - - p. 381
- ✓ 301. Similar Return for half-year ending on 31st March 1877 - - - - 383

Marine Survey :

- ✓ 118. General Report of the Operations of the Marine Survey of India, from the commencement in 1874 to the end of the Official Year 1875-6 - - - - 385

Prison Discipline :

- ✓ 185. Report by Miss Mary Carpenter on Prison Discipline, and on Female Education in India - - - - - 427

Prisoners, Release of :

- ✓ 85. Notifications by the Government of India relating to the Release of Prisoners on the Occasion of the Assumption of the Title of Empress of India by Her Majesty the Queen - - - - - 449

✓ Progress and Condition :

- ✓ 378. Statement exhibiting the Moral and Material Progress and Condition of India, during the Year 1875-76 - - - - - 453

Railways :

- ✓ [c. 1823.] Report to the Secretary of State for India in Council on Railways in India, for the Year 1876-77 - - - - - 535

Revenue and Expenditure, 1861-2 to 1877-8 :

- ✓ 256. Statement showing the Revenue and Expenditure of India in each Year from 1861-2 to 1877-8 (including Expenditure on Famine, but excluding that on Public Works Extraordinary, from 1867-8), the Surplus or Deficit in each Year, and the Net Amount of Debt incurred from 1861-2 to 1876-7 - 585

Silver :

- ✓ 120. Papers received from the Government of India, and from Her Majesty's Representatives and Consuls in Foreign Countries, having reference to the Silver Question (in continuation of Papers laid before the Select Committee, 1876, on the Depreciation of Silver) - - - - - 587
- ✓ 416. Letter from the Government of India, forwarding Reports by the Bengal and Bombay Chambers of Commerce, regarding the Effects of the Fall in the Price of Silver on Trade and Remittances and on Prices in India - - - - 713

Trade with Western China :

- ✓ 170. Despatches and Letters relating to the Trade between East India and Western China (in continuation of Paper [c. 1456], of 1876) - - - - 749

Troop Ships :

- ✓ 249. Return of Cost, Tonnage, Power and Consumption of Coal, also Expense of Service of the Troop Ships "Crocodile," "Euphrates," "Jumna," "Malabar," and "Serapis," for the Year 1875-76 (in continuation of Paper, No. 119—I., of 1876) - - - - - 755

Weld, Mr. :

- ✓ 265. Correspondence and Papers relating to the Suspension of Mr. Weld, for, as Magistrate of Negapatam, causing the Exhumation of a Body of a Saniyasi buried on the Banks of Drinking Water Reservoir at that Place - - - - 767

EAST INDIA (CHINCHONA CULTIVATION).

FURTHER RETURN to an Address of the Honourable The House of Commons,
dated 8 July 1875;—for,

COPIES

OF THE

CHINCHONA CORRESPONDENCE

(In continuation of Return of 1870)

FROM AUGUST 1870 TO JULY 1875.

India Office, }
20 June 1877. }

GEORGE HAMILTON,
Under Secretary.

(Mr. Muntz.)

Ordered, by The House of Commons, to be Printed,
21 June 1877.

TABLE OF CONTENTS.

From	Date.	Subject.	Page.
GOVERNMENT OF MADRAS - -	7 Feb. 1871 No. 6 (Revenue).	On maintenance of the Government Chinchona Plantations, of the manufacture of Quinine in the Presidency, and on export of Bark for sale in the London market.	1
Enclosures:			
Commissioner of the Neilgherries.	28 May 1870	The Annual Report on Government Chinchona Plantations and Botanical Gardens at Ootacamund for 1869-70.	2
Superintendent of Chinchona Plantations.	16 May 1870	Forwarding Annual Report - - - - -	4
Commissioner of the Neilgherries.	14 Sept. 1870	Forwarding the Half-yearly Tabular Report on Ootacamund Chinchona Plantations, dated 31st July 1870.	11
Superintendent of Chinchona Plantations.	10 Sept. 1870	Tabular Report - - - - -	11
<i>Order of Madras Government thereon.</i>	21 Dec. 1870	- - - - -	12
Government Quinologist - -	31 Aug. 1870	Some results of employing the Chinchona febrifuge in India.	13
Commissioner of the Neilgherries.	2 Sept. 1870	Forwarding Mr. Broughton's and Mr. McIvor's replies to queries in Secretary of State's Despatch of 19th May 1870, No. 13.	17
Government Quinologist - -	8 Aug. 1870	Replies to Queries - - - - -	20
Superintendent of Chinchona Plantations.	5 Aug. 1870	Forwarding Mr. Broughton's and Mr. McIvor's replies to queries in Secretary of State's Despatch of 19th May 1870, No. 13.	22
Superintendent of Chinchona Plantations.	26 Jan. 1871	Not desirable to incur further expenditure on Upper Chinchona Plantations at Mailkoondah, but desirable to maintain the Lower Plantations.	23
<i>Order of Madras Government</i> -	7 Feb. 1871	On the question of maintaining the Chinchona Plantations, &c.	23
GOVERNMENT OF MADRAS - -	14 Feb. 1871 No. 7 (Revenue).	Mr. Broughton's engagement as Government Quinologist renewed on expiry.	25
GOVERNMENT OF MADRAS - -	28 Feb. 1871 No. 10 (Revenue).	Forwarding the Half-yearly Tabular Report from Ootacamund for 31st January 1871.	25
Enclosure:			
Commissioner of the Neilgherries.	15 Feb. 1871	Tabular Report - - - - -	25
SECRETARY OF STATE - - -	27 April 1871 No. 11 (Public).	Forwarding the following letter to Mr. Markham on Quinovine.	27
Enclosures:			
Dr. de Vrij - - - -	17 April 1871	Letter on Quinovine - - - - -	27
Dr. de Vrij - - - -	23 April 1871	Paper on use of Quinovine in medicine - - - - -	28
Circular - - - -	- -	On Quinovinate of Lime - - - - -	28
SECRETARY OF STATE - - -	29 June 1871 No. 15 (Public).	Forwarding 100 copies of a translation of Mr. Weddell's "Classification of the Chinchona Genus," and 30 copies of Mr. Cross's Report on his mission to the Pitago Chinchona Forests of New Grenada.	29
GOVERNMENT OF MADRAS - -	4 April 1871 No. 17 (Revenue).	Requests statement of total outlay of 4½ tons of acid referred to in Secretary of State's Despatch of 27th January 1870, No. 1.	29

From	Date.	Subject.	Page.
SECRETARY OF STATE - - -	6 July 1871 No. 17 (Revenue).	Forwarding the statement referred to - - - -	30
SECRETARY OF STATE - - -	13 July 1871 No. 18 (Public).	Requests parcels of ripe Chinchona seed grown in India for transmission to Mexico.	30
GOVERNMENT OF MADRAS - -	21 Sept. 1871	Forwarding the Half-yearly Tabular Report on Ootacamund Chinchona Plantations for 31st July 1871.	31
Enclosures : Superintendent of Chinchona Plantations.	18 Sept. 1871	Tabular Report - - - - -	31
Superintendent of Chinchona Plantations.	23 Aug. 1871	Number of Chinchona Plants permanently planted out in June and July 1871.	32
GOVERNMENT OF MADRAS - -	20 Oct. 1871 No. 5 (Forests).	Forwarding papers on experimental cultivation of Chinchona in Malabar, South Canara, Ganjam, Tinnevely, and Madura.	32
Enclosures : Abstract of Revenue Proceedings	12 Mar. 1870	- ditto - - - - - ditto - -	33
Officiating Conservator of Forests, Madras.	28 Mar. 1870	- ditto - - - - - ditto - -	34
<i>Order of Madras Government thereon.</i>	14 May 1870	- - - - -	35
Revenue Board Proceedings on ditto.	4 June 1870	- ditto - - - - - ditto - -	35
Conservator of Forests, Madras	15 June 1870	- ditto - - - (in Wynaad and Coorg) - -	35
<i>Order of Madras Government thereon.</i>	8 Aug. 1870	- - - - -	36
Acting Collector of Ganjam -	2 July 1870	- ditto - - - - - ditto - -	36
<i>Order of Madras Government thereon.</i>	18 Aug. 1870	- - - - -	36
Acting Collector of Ganjam -	16 Dec. 1870	- ditto (Estimated cost of plantation in Mahendra Mountain).	36
<i>Order of Madras Government thereon.</i>	16 Jan. 1871	- - - - -	37
Acting Collector, South Canara	13 June 1871	- ditto - - - - (Nagoda) - - ditto - -	37
Revenue Department note on above.	- - -	- ditto - - - - ditto - - - -	38
<i>Order of Madras Government thereon.</i>	27 July 1871	- - - - -	38
Revenue Proceedings - - -	11 Oct. 1871	- ditto (no reply from Pulnies by Mr. McIvor) ditto - -	39
Mr. G. A. Campbell - - -	18 June 1870	- ditto - - - - (Madura) - - - ditto - -	39
Revenue Board Order thereon -	- - -	- ditto - - - - ditto - - - ditto - -	39
Collector of Madura - - -	19 Sept. 1870	- ditto - - - - ditto - - - ditto - -	39
Government Quinologist - -	October 1870	- ditto - - - - ditto - - - ditto - -	40
Government Quinologist - -	22 July 1870	- ditto - - - - ditto - - - ditto - -	40
SECRETARY OF STATE - - -	20 Dec. 1871 No. 12 (Forests).	Replying to above, and of opinion that the Wynaad district has a special claim to Government assistance in extending the cultivation of Chinchona febrifuge plants.	41

From	Date.	Subject.	Page.
GOVERNMENT OF MADRAS - -	14 Nov. 1871 No.49 (Revenue).	Transmission of Chinchona seeds grown in India for Mexico	41
Enclosure : Superintendent of Chinchona Plantations.	24 Oct. 1871	- ditto - - - - - ditto - -	42
GOVERNMENT OF MADRAS - -	21 Aug. 1871. No.36 (Revenue).	Transmission of 3,188 lbs. of Chinchona bark for sale in the English market.	42
Enclosures : Commissioner of the Neilgherries	2 Aug. 1871	- ditto - - - - - ditto - -	42
<i>Order of Madras Government thereon.</i>	4 Aug. 1871	- - - - - - - - - - -	43
Government Quinologist - -	3 Aug. 1871	- ditto (details of packing and analysis of bark) ditto - -	43
SECRETARY OF STATE - - -	11 Jan. 1872 No.3 (Revenue).	Result of sale of above 2 s. 1 d. to 2 s. 10 d. per lb. - -	44
SECRETARY OF STATE - - -	25 Jan. 1872 No.9 (Revenue).	- ditto; net sum paid in by broker, 333 l. 8 s. 6 d. - -	44
GOVERNMENT OF MADRAS - -	7 Nov. 1871 No.45 (Revenue).	Forwarding a Report on analyses of Chinchona bark grown in India during last two years.	45
Government Quinologist - -	31 July 1871	Analyses of bark - - - - -	45
<i>Order of Madras Government thereon.</i>	26 Sept. 1871	- - - - -	49
SECRETARY OF STATE - - -	11 Jan. 1872 No.4 (Revenue).	Replying to above.—Advisable to cultivate one set of barks for use of natives, and another for sale in London. —Hybridisation to be guarded against.—Repeats request that a complete set of flowering and fruit-bearing branches and barks of each Chinchona species grown on the Neilgherries, be forwarded to the India Office.	49
SECRETARY OF STATE - - -	8 Feb. 1872 No. 10 (Revenue).	Forwarding, with observations, notes on above analysis -	50
Enclosure : Mr. Howard - - - -	16 Jan. 1872	Notes referred to - - - - -	50
GOVERNMENT OF MADRAS - -	15 Feb. 1872 No. 4 (Revenue).	Forwarding comparison of growth between Chinchona plants grown in British Sikkim and on the Nilgiris, and refuting statement that those supplied from the latter to Darjeeling were affected with canker.	54
Enclosures : Superintendent of Chinchona Plantations.	23 Oct. 1871	- - - - ditto - - - - ditto - - - -	54
Commissioner of the Nil- giris.	1 May 1871	- - - - ditto - - - - ditto - - - -	55
Superintendent of Chinchona Plantations.	25 April 1871	- - - - ditto - - - - ditto - - - -	56
<i>Order of Madras Government thereon.</i>	26 May 1871	- - - - - - - - - - -	61
Commissioner of the Nil- giris.	13 Dec. 1871	- - - - ditto - - - - ditto - - - -	61
Superintendent of Chinchona Plantations.	6 Dec. 1871	- - - - ditto - - - - ditto - - - -	61
GOVERNMENT OF MADRAS - -	29 Feb. 1872 No. 7 (Revenue).	Forwarding the half-yearly Tabular Report on Chinchona Plantation at Ootacamund for 31st January 1872.	64
Superintendent of Chinchona Plantations.	7 Feb. 1872	Tabular Report - - - - -	65
GOVERNMENT OF MADRAS - -	7 Mar. 1872 No. 11 (Revenue).	Transmission of 4,106 lbs. of Chinchona bark for sale in the English market.	66
Enclosure : Government Quinologist - -	16 Feb. 1872	- ditto - (packing account and analysis) - ditto -	66
Commissioner of the Nil- giris.	1 Mar. 1872	- ditto - (to be protected from salt water) - ditto -	67
Superintendent of Chinchona Plantations.	29 Feb. 1872	- ditto - - - - - ditto - - - - - ditto -	67

From	Date.	Subject.	Page.
SECRETARY OF STATE - - -	9 May 1872 No. 18 (Revenue).	Transmitting five copies of " <i>Nouvelles Etudes sur les Quinquinas, &c., par J. Triana.</i> "	68
GOVERNMENT OF MADRAS - -	4 June 1872 No. 21 (Revenue).	Forwarding an indent for a supply of sulphate of ammonia and Peruvian guano, and a Report on action of certain manures on Chinchonas.	68
Enclosures:			
Government Quinologist - -	7 Mar. 1872	Report referred to - - - - -	68
<i>Order of Madras Government thereon.</i>	10 April 1872	- - - - -	71
SECRETARY OF STATE - - -	8 Aug. 1872 No. 28 (Revenue).	Reporting result of the sale of Chinchona bark (amount received, 429 l. 13 s. 5 d.), and that the supply of manure indented for has been ordered.	72
GOVERNMENT OF MADRAS - -	13 Sept. 1872 No. 28 (Revenue).	Forwarding Enclosures - - - - -	72
Enclosures:			
Commissioner of the Nilgiris.	9 June 1871	Submitting the following Report, with observations - -	73
Superintendent of Chinchona Plantations.	31 May 1871	Report on Nilgiri Chinchona Plantations for 1870-71 -	73
<i>Order of the Madras Government thereon.</i>	13 Mar. 1872	- - - - -	78
Commissioner of the Nilgiris.	12 July 1872	Submitting the following Report, with observations -	78
Superintendent of Chinchona Plantations.	24 May 1872	Report on Nilgiri Chinchona Plantations for 1871-72 -	79
<i>Order of Madras Government thereon.</i>	20 Aug. 1872	- - - - -	83
Commissioner of the Nilgiris.	20 April 1871	No prospect of selling on reasonable terms the Pycarah and Maillkoondah Chinchona Plantations. Plan for reducing estimate of expenditure for Chinchona Plantations for 1871-72, from Rs. 39,100 to Rs. 28,286.	84
Superintendent of Chinchona Plantations.	17 April 1871	Opinion of <i>proposed reduction</i> of expenditure - - -	87
<i>Order of Madras Government thereon.</i>	8 June 1871	- - - - -	88
GOVERNMENT OF MADRAS - -	10 Dec. 1872 No. 36 (Revenue).	Replying to a statement in Secretary of State's Despatch, dated 8th August 1872 (No. 28), that bark grown on a private plantation on the Nilgiris realised a higher price than that grown in the Government plantations.	89
Enclosure:			
Commissioner of the Nilgiris -	16 Nov. 1872	Explains that the high price was only realised by bark grown at a greater elevation, and therefore containing a larger per-centage of alkaloid.	89
Superintendent Chinchona Plantations.	31 Oct. 1872	- - - - ditto - - - - ditto - - - -	89
GOVERNMENT OF MADRAS - -	11 July 1873 No. 18 (Revenue).	Advising transmission of specimens of flowering and fruit-bearing branches, and bark grown on the Nilgiris.	90
Enclosures:			
Commissioner of the Nilgiris -	23 June 1873	Submitting following letter on the above - - - -	90
Superintendent Chinchona Plantations.	21 May 1873	- - - - ditto - - - - ditto - - - -	90
GOVERNMENT OF MADRAS - -	31 July 1873 No. 21 (Revenue).	Forwards correspondence on relative merits of Mr. Melvor's plan for mossing bark, and the coppicing system.	91
Enclosures:			
Commissioner of the Nilgiris -	19 April 1873	Submits, with observations, a Report on the above subject	91
Government Quinologist -	11 Feb. 1873	Report - - - - -	93
<i>Order of Madras Government thereon.</i>	29 May 1873	- - - - -	103

From	Date.	Subject.	Page.
GOVERNMENT OF MADRAS - -	12 Sept 1873 No. 24 (Revenue).	Advising consignment of 23,846 lbs. of Chinchona bark for sale in open market in London, and forwarding correspondence.	103
Enclosures :			
Commissioner of the Nilgiris -	2 April 1873	- - - - ditto - - - - ditto - - - -	104
Superintendent Chinchona Plantations.	24 Mar. 1873	- - - - ditto - - - - ditto - - - -	104
<i>Order of Madras Government thereon.</i>	22 April 1873	- - - - - - - - - -	104
Acting Collector of Sea Customs	14 May 1873	- - - - ditto - - - - ditto - - - -	105
<i>Order of Madras Government thereon.</i>	23 May 1873	- - - - - - - - - -	105
Collector of Sea Customs -	14 Aug. 1873	- - - - ditto - - - - ditto - - - -	105
Commissioner of the Nilgiris -	12 Aug. 1873	Mossing to be stopped, in order that some young trees may be left on which to try the coppicing system.	105
Superintendent Chinchona Plantations.	31 July 1873	- - - - - - - - - -	106
<i>Order of Madras Government thereon.</i>	5 Sept. 1873	- - - - - - - - - -	106
GOVERNMENT OF MADRAS - -	26 Sept. 1873 No. 30 (Revenue).	In continuation of No. 24, of 12th instant, and forwarding analyses of samples of barks sent to England for sale.	107
Enclosures :			
Government Quinologist - -	9 Aug. 1873	Analysis referred to - - - - - - - -	107
Commissioner of the Nilgiris -	12 Aug. 1873	Notes on above - - - - - - - -	108
GOVERNMENT OF MADRAS - -	10 Oct. 1873 No. 32 (Revenue).	Forwarding Enclosures on mossing and coppicing systems, and forwarding Annual Report on the Nilgiris Chinchona Plantations for 1872-73.	108
Enclosures :			
Commissioner of Nilgiris -	10 July 1873	- - - - ditto - - - - ditto - - - -	108
Superintendent Chinchona Plantations.	- - -	Annual Report - - - - - - - -	110
<i>Order of Madras Government thereon.</i>	13 Sept. 1873	- - - - - - - - - -	115
GOVERNMENT OF MADRAS - -	10 Oct. 1873 No. 34 (Revenue).	In continuation of No. 4 (see page 58), forwarding further correspondence showing improbability of canker existing in the Chinchona plants when sent from the Nilgiris to the Sikkim plantation, though it is possible that the disease may have been generated on the journey.	116
Enclosures :			
Secretary to Government of India	1 Oct. 1872	Forwarding to Madras the following correspondence on this subject, with remarks.	117
Superintendent, Botanic Gardens, in charge of Chinchona Plantations in Bengal.	12 July 1872	Forwarding a commentary on statements by the following gentlemen, showing that the plants were diseased before arriving in Bengal:	117
		Dr. Simpson, Civil Surgeon of Patna - - - -	119
		Mr. Munro, Manager of Pomong Plantation - - - -	119
		Mr. Jaffrey, of Government Chinchona Plantation - - - -	121
		Mr. Gammie, Resident Manager of Chinchona Plantation - - - -	122
		Mr. Scott, Curator of Botanic Garden - - - -	123
Commissioner, Nilgiris - -	19 July 1873	Forwarding reply to the foregoing statements - - - -	123
Superintendent Chinchona Plantation.	12 July 1873	Reply - - - - - - - - - -	124
<i>Order of Madras Government on the Correspondence.</i>	12 Sept. 1873	- - - - - - - - - -	127
Acting Secretary to Madras Government.	2 Oct. 1873	Forwarding the above Proceedings of the Madras Government to the Government of India.	127

From	Date.	Subject.	Page.
SECRETARY OF STATE - - -	16 Dec. 1873 No. 25 (Revenue).	Result of sale of the 25,000 lbs. of bark from the Nilgiris, and forwarding, with comments, Mr. Howard's letter on the prompt supply of a Chinchona febrifuge to the people of India (<i>see Part I., p. 139</i>).	128
GOVERNMENT OF MADRAS - - -	16 Dec. 1873 No. 40 (Revenue).	Forwarding Proceedings on therapeutic effects of <i>Calcic Quinovinate</i> in the treatment of fevers, dysentery, and diarrhoea; found unsatisfactory; further experiments unnecessary.	129
Government Quinologist - - -	9 June 1871	- - - - -	130
Acting Inspector General, Indian Medical Department.	1 July 1871	- - - - -	130
Order of Madras Government -	12 July 1871	The Quinologist to furnish Inspector General with 5 lbs. of <i>Calcic Quinovinate</i> .	131
Officiating Surgeon General -	16 Sept. 1873	Report on trials with the above - - - - -	131
		Appendix.—Extract.—Report by Surgeon Major C. J. Rogers.	132
		" " " Surgeon W. N. Chipperfield	132
		" " " Surgeon Major L. W. Stewart.	132
		" " " Surgeon L. C. Nanney	132
		" " " Surgeon C. A. Andrews	132
		" " " J. Houston, M.D.	133
		" " " D. W. Trimmell -	133
GOVERNMENT OF MADRAS - - -	13 Jan. 1874	Forwarding Report on the native febrifuge "Atis," <i>Aconitum heterophyllum</i> .	133
Government Quinologist - - -	25 Oct. 1873	Report - - - - -	133
Order of Madras Government -	8 Dec. 1873	- - - - -	135
SECRETARY OF STATE - - -	19 Mar. 1874 No. 2 (Revenue).	Requesting that further experiments be made with <i>Calcic Quinovinate</i> , and that specimens of "Atis," as sold in the Bazaars, and of Atisial hydrochlorate, be forwarded to the India Office.	135
GOVERNMENT OF MADRAS - - -	30 Oct. 1874 No. 25 (Revenue).	Forwarding Enclosures - - - - -	136
Commissioner, Nilgiris - - -	30 June 1874	Forwarding Review of the Report on Government Chinchona Plantations for 1873-74.	136
Superintendent Chinchona Plantation.	15 June 1874	Report - - - - -	137
Order of Madras Government thereon.	2 Sept. 1874	- - - - -	142
Superintendent Chinchona Plantation.	3 Sept. 1874	Half-yearly Tabular Report on Nilgiri Chinchona Plantation, 31st July 1874.	143
Order of Madras Government thereon.	25 Sept. 1874	- - - - -	144
SECRETARY OF STATE - - -	28 Jan. 1875	Reviewing the above, and calling for detailed Report on the Alkaloid Manufactory, showing cost, out-turn, and price realised; and requesting equal use of coppicing and mowing systems till a reliable result has been ascertained.	144
GOVERNMENT OF MADRAS - - -	9 Mar. 1875 No. 6 (Revenue).	Forwarding Reports by Government Quinologist and Surgeon General on Amorphous Quinine; manufacture of, discontinued; resignation of Quinologist.	145
Government Quinologist - - -	1 Dec. 1873	Report on manufacture of Amorphous Quinine - - -	146
		Appendix: Cost of Alkaloid manufacture in 1872-73 -	152
Government Quinologist - - -	14 Mar. 1874	Forwarding, with comments, Statement of Total Expenditure incurred on the Alkaloid Manufactory during the official years 1869-73 inclusive.	154
		Statement - - - - -	155
Surgeon General, Madras - - -	28 April 1874	Report on comparative cost and efficacy of Quinine, Chinchonidine, Quinidine, Chinchonine, and Amorphous Quinine in Madras Presidency.	156

From	Date.	Subject.	Page.
Commissioner of Nilgiris -	14 Mar. 1874	Forwarding, with comments, Report on changes produced by age and growth in Chinchona trees in Government Plantations. List of prices and analysis of Java bark sold in Amsterdam, compared with Nilgiri bark sold in London.	159
Superintendent Chinchona Plantations.	14 Feb. 1874	Report - - - - -	159
	27 April 1874	Minute by the Honourable J. D. Sim - - - - -	162
	30 April 1874	Minute by the Honourable W. Robinson - - - - -	163
	23 May 1874	Minute by His Excellency the Commander in Chief - - - - -	163
	6 June 1874	Minute by His Excellency the Governor - - - - -	163
Order of Madras Government -	22 June 1874	Mr. Cornish and the Commissioner of the Nilgiris to inquire and report fully on the matter on Mr. Broughton's return to India. Mr. Howard and Dr. de Vrij to be supplied with Amorphous Quinine for analysis and valuation.	163
Government Quinologist - -	Aug. 1873	Forwarding Report on changes of growth and age of trees in Government Chinchona Plantation.	165
Government Quinologist - -	22 Aug. 1873	Report - - - - -	166
Order of Madras Government -	15 Dec. 1873	To be forwarded to Commissioner, Nilgiris, with Mr. Broughton's letter for Mr. McIvor's opinion.	171
	28 Nov. 1873	Report of Committee appointed in Government Order of 22nd June 1874.	171
	19 Dec. 1874	Minute by the Honourable J. D. Sim - - - - -	183
	20 Dec. 1874	Minute by His Excellency the Commander in Chief - - - - -	185
	24 Dec. 1874	Minute by His Excellency the Governor - - - - -	185
	27 Dec. 1874	Minute by the Honourable W. Robinson - - - - -	185
Order of the Madras Government.	11 Feb. 1875	The manufacture of to be abandoned, and Mr. Broughton's resignation to be accepted.	185
GOVERNMENT OF MADRAS - -	24 Mar. 1875 No. 3 (Revenue).	Forwarding advice of the shipment of 278 bales of Chinchona bark (28,659½ lbs. net).	187
Superintendent Chinchona Plantations.	9 Mar. 1875	Advice - - - - -	187
Superintendent Chinchona Plantations.	1 Mar. 1875	Half-yearly Tabular Report on Nilgiri Chinchona Plantations for 31st January 1875.	187
GOVERNMENT OF MADRAS - -	6 April 1875 No. 10 (Revenue).	Replying to Secretary of State's Despatch, No. 3 of 1875, mossing system used only because coppicing cannot be practised for two years. Detailed experiments for comparing the systems are now on foot.	188
GOVERNMENT OF MADRAS - -	23 July 1875 No. 23 (Revenue).	Freight of 278 bales of bark is 4l. 5 s. per ton, and not 2l. 5 s., as stated in Enclosures to Madras Despatch, No. 3 of 1875.	189
Commissioner, Nilgiris - -	13 April 1875	- - ditto - - - - -	189
Order of Madras Government -	20 April 1875	- - - - -	189
Superintendent Chinchona Plantations.	20 Aug. 1875	Half-yearly Tabular Report on Nilgiri Chinchona Plantations for 31st July 1875.	189

CORRESPONDENCE

RELATING TO

CHINCHONA CULTIVATION IN INDIA.

— No. 1. —

(No. 6—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Duke, Fort St. George, 7 February 1871.

WE have the honour to reply to your Despatch, dated 19th May 1870, No. 13, relating to the maintenance of the chinchona plantations and the utilisation of the bark in this Presidency. In our Proceedings, marginally noted (which accompany), are recorded the views of the Commissioner of the Neilgherries, of the Government Quinologist, and of the Superintendent of the plantations, on the questions raised by your despatch. It remains for us briefly to state our own views.

Proceedings of Government, 7th February 1871,
Nos. 87 and 91.
Proceedings of Government, 21st December 1870,
Nos. 401-403.

2. In determining the position which the State is hereafter to hold with regard to the supply of quinine, a choice lies between the following courses of action, or an intermediate policy:—

(1.) The retention and maintenance by the State of the chinchona plantations, and the institution of a regular system of quinine manufacture by the State for Indian requirements.

(2.) The abandonment by the State of both branches of industry in favour of private enterprise.

(3.) The retention of the plantations by the State with a view to the manufacture of quinine from the bark in England.

(4.) The sale of the plantations, but the retention by the State of the process of quinine manufacture for Indian requirements at Ootacamund.

3. The plantations on the Neilgherries (which have now been completely occupied) are four in number, and comprise an aggregate area of 1,200 acres, as marginally shown. The two last named are the least important; it is doubtful whether their probable future utility justifies the annual outlay on them, and the inconvenience resulting from two separate establishments. We therefore propose to relinquish all further attempts at cultivating the Mailkoondah Estate, a considerable portion of which has proved a complete failure; and if we can obtain a reasonable price from a purchaser whose position and means offer some guarantee that the care and expenditure already bestowed on the plantations will not be thrown away, owing to subsequent neglect, we would propose to sell both the Mailkoondah tract, and also the plantation at Pykara. As an alternative arrangement, tending to economy, they may be permitted to develop, as uncultivated chinchona copses or forest, the condemned portion of the Mailkoondah Estate being abandoned altogether.

	Acre.
At Dodabetta	375
„ Neddivuttum	450
„ Pykara	300
„ Mailkoondah	75
Total	1,200

4. The two remaining estates should, we consider, certainly be retained in the hands of Government. State supervision cannot ordinarily compete with ably-directed private enterprise; but it does not follow that a project should be relinquished when the cost of it is rapidly decreasing, while the profits are only beginning

• Rs. 5,57,699.

beginning to be realised. Up to the present time the total outlay* on the Neilgherry chinchona plantations has exceeded five lakhs of rupees.

5. Even if it were certain that greater economy would in the end be attained by the sale of the plantations, it must be remembered that chinchona-planting in India, although a proved success, has not yet altogether lost the character of an experiment, which it would be unsafe to entrust to private hands; for the barks of the already discovered species of chinchona yield a varying ratio of alkaloids at different stages of their growth, and it is possible that the species now least valued may, when more matured, be found rich in alkaloids, and *vice versa*. The questions raised by the frequent discovery of fresh varieties of chinchona, or of an unprecedentedly large proportion of alkaloids in some of the known varieties, will be most expeditiously solved under Government supervision, which allows the freest scope for experiments.

6. The next question to be decided is, whether the requisite process for preparing quinine from the bark is to be conducted entirely at Ootacamund, or whether the whole or a portion of the bark is to be sent to the London market to be worked up there.

7. We are of opinion that the Quinologist should be allowed every facility for developing the preparations of bark febrifuge best suited for Indian requirements. It is difficult to predict now whether 10 years hence it will be cheaper to manufacture quinine in this country, or to send the bark to England for manufacture; because all calculations founded on existing data may be inapplicable when the process of manufacture is cheapened in England by large imports of bark from the numerous foreign plantations which will soon be productive. As, however, the "Amorphous Quinine," which Mr. Broughton is now manufacturing at an estimated cost of one rupee per ounce, is found highly efficacious, there can be no doubt as to the expediency of continuing its preparation in this country. The quinologist has also shown that, by working up the bark on the spot, many difficulties incident to the conduct of the process at a distance from the plantations are avoided, and much weight is due to this argument.

8. It is, however, evident from Mr. Broughton's letter that, unless a reduced price operates in increasing the consumption of quinine far beyond its present rate, the supply of bark procurable from the Government plantations will soon exceed the demand. We deem it, therefore, highly advisable that samples of Neilgherry bark should be sent to the home market. We learn that 900 kilos of bark have already been shipped from Java, that 1,000 kilos are ready for shipment, and 2,000 kilos more were expected to be collected and shipped before the end of last year. With this and other additional sources of supply, the price of the bark must soon fall, and we have, therefore, ordered 4,000 lbs. to be prepared for early shipment. We purpose to continue the exportation of as much bark as is not required for use in India.

We have, &c.
(signed) Napier, &c.

Enclosure 1, in No. 1.

From the Commissioner of the Neilgherries to the Secretary to Government, Revenue Department, Madras; dated Ootacamund, 28th May 1870, No. 25.

I HAVE the honour to forward the Superintendent's Annual Report on the Government Chinchona Plantations and Botanical Gardens of Ootacamund for 1869-70.

2. I have lately seen the plantations at Dodabetta, Neddivattum, Pycarah, and Mailkoondah; and the three former retain their high character, and do great credit to Mr. McIvor's horticultural skill, and to the zeal and industry of all connected with the plantations. I regret I cannot speak so satisfactorily of the Mailkoondah plantation, which I shall refer to more particularly by-and-by.

3. During the year the superintendent reports that 254,367 plants were planted out, against 153,145 in 1868-69; and 17,526 plants were propagated, against 19,703 in 1868-69.

Since the receipt of Government Order, dated 9th November 1869, the superintendent has devoted his attention to the propagation of the Pitayo variety, and the newly-discovered variety of *Chinchona officinalis*.

4. The

4. The Government will observe that 1,200 acres, the area originally fixed as the limit to which the chinchona plantations were to extend, have now been planted up as follows:—

	Acres.
At Dodabetta - - - - -	375
„ Neddivattum - - - - -	450
„ Pycarah - - - - -	300
„ Mailkoondah - - - - -	75
Total - - - - -	1,200

The superintendent estimates that adjoining the three plantations of Neddivattum, Pycarah, and Mailkoondah, about 1,000 acres suitable for chinchona are still available if wanted.

5. Up to 31st March 1870 the total expenditure on account of chinchona on the Neilgherries amounted to 557,699 rupees, which may be subdivided as follows:—

	Rs.
Superintendent and office - - - - -	65,860
Propagation and nursery - - - - -	54,498
	Rs.
Dodabetta - { Establishment - - - - -	38,371
{ Buildings, &c. - - - - -	22,486
{ Plantation work - - - - -	67,689
	1,28,546
Neddivattum - { Establishment - - - - -	79,274
{ Buildings, &c. - - - - -	27,958
{ Plantation work - - - - -	94,692
	2,01,924
Pycarah - { Establishment - - - - -	11,746
{ Buildings, &c. - - - - -	6,188
{ Plantation work - - - - -	46,762
	64,696
Mailkoondah - { Establishment - - - - -	9,005
{ Buildings, &c. - - - - -	3,778
{ Plantation work - - - - -	29,392
	42,175
TOTAL - - - - -	Rs. 5,57,699

This gives a total expenditure of 464 rupees per acre.

6. I believe the Government of India have in Sikkim about 1,250 acres under chinchona, the total cost of which, up to the 31st March 1870, has reached Rs. 3,43,518. 10. 5. It would be interesting to have the acreage and expenditure verified, so as to institute a comparison between our plantations and theirs. The information would aid towards forming some conclusion as to the probable cost per pound of bark at which each species can be grown in different parts of India.

It is very probable that the Sikkim plantations, from climate and other reasons, will be unable to compete with ours in the growth of the *Officinalis* and such species, while they will outstrip us in the rapid and cheap growth of the *Calisaya* and *Succirubra*.

7. 4,000 *Succirubras* and 2,000 *Condamineas* have been mossed. Under Mr. Broughton's hands the value of this process will in due course be effectually tested by periodical analysis.

8. Up to 31st March last 42,175 rupees have been spent upon the Mailkoondah plantation. The plantation consists of two clearings in the great forest which covers the hills to the south-west of the village of Mailkoondah. The clearing on which the gaol and the superintendent's cottage have been built is at a higher elevation than the other, and may contain 20 or 30 acres. The superintendent's cottage has tumbled down; the few acres planted seemed to be eaten off by the sambar; I saw nothing but here and there a few chinchona-sticks without leaves.

The gaol-walls are cracked in every direction, and the approaching monsoon will, I fear, bring the building to the ground.

The lower clearing is about 1½ miles from the gaol, and is situated on the slope of a spur of the Koondah Hills.

Here the *Succirubra* seemed to be doing fairly well; the trees were about two feet high, but suffer greatly, I was informed, from the violence of the monsoon winds. With reference to my remarks, in paragraphs 4 and 5 of my letter to Government, dated 18th October 1869, I am still of opinion that it is not worth while incurring further expense on this plantation.

9. I am disposed to recommend that the Government should cease all further outlay whatever on the plantation, and endeavour to sell the upper clearing, with its buildings and materials as they stand.

The lower plantation, if the Government thought proper, might be left, as an experiment, to see how the chinchona trees will fare when left entirely to themselves in a clearing in the heart of the forest.

10. The Botanical Gardens have received some important contributions from Messrs. E. B. Thomas and Deschamp, Colonel Denison and Major Beddome. Some improvement has, I think, been made in the general up-keep of the gardens under the immediate direction of Mr. Jamieson.

It would be desirable, in future years, to keep the report of the Botanical Gardens altogether distinct and separate from the Chinchona Report, so as to admit of more detail as to the number of hands employed in the gardens during the year, the nature of work performed, the introduction of new species by exchange or otherwise, and the stock of plants available for distribution and sale, &c., &c.

A statement of the year's receipts and disbursements should also be given. Without such a detailed report it is impossible to institute a satisfactory system of exchange with other gardens in other parts of the world, nor can we say whether the utility of the Ootacamund gardens is properly maintained, nor can the public know what facilities exist of stocking their gardens with useful and ornamental plants.

Ootacamund, 28 May 1870.

REPORT on the GOVERNMENT CHINCHONA PLANTATIONS and BOTANICAL GARDENS, Ootacamund, Neilgherries, for the Official Year 1869-70.

DURING the past year we have completed planting the sanctioned extent of our chinchona plantations, namely, 1,200 acres; a few additional acres are reserved for planting with the new varieties recently introduced, and the lanceolate-leaved variety of *Officinalis*.

2. During the year 12 cooly, 76 bullock, and 21 cart-loads of fresh bark were supplied for manufacture to Mr. Broughton, the Government Quinologist. At present we are supplying that gentleman with about 2,000 lbs. of fresh bark weekly. We may therefore calculate the yield this year of fresh bark from the plantations to be upwards of 100,000 lbs., or about 45 tons.

3. The past season has been very favourable for planting operations, and the growth of the plants very satisfactory.

4. The plants permanently planted out in August and September 1862 have attained heights varying from 20 feet to 25 feet, the circumference of the stems, at one foot above the ground, measuring from 25 inches to 32 inches.

5. The number of plants planted out during the year were 254,367, making the total number 1,148,424. The number of plants propagated were 17,526, against 19,703, the result of the last year. Our propagation has lately been principally confined to the Pitayo varieties and the new variety of *Officinalis*.

6. The number of plants distributed to the public during the year were 7,755, making the total number 178,605. Private planters now prefer seeds, and a large quantity of these have been distributed.

7. With the foregoing observations I shall proceed to the details of this report, which are arranged under the following heads:—

- I. Condition and growth of plants.
- II. Propagation.
- III. Cultivation.
- IV. Results obtained by private planters.
- V. Chinchona, new varieties, remarks on.
- VI. Formation of alkaloids.
- VII. Establishment.
- VIII. Progress of operations.
- IX. Botanical Gardens.
- X. Tea plantation.
- XI. Freshwater fish.
- XII. Appendix A, Accounts from commencement to 31st March 1870.
- XIII. Appendix B, Meteorological Observations at Neddivattum.
- XIV. Appendix C, Meteorological Observations at Ootacamund.

I. *Condition and growth of plants.*—The red bark (*Cinchona succirubra*) continues to be the most luxuriant of all the species we have introduced. The grey barks also maintain a very luxuriant growth, while the crown-barks and our new varieties of yellow bark rank third. The new lanceolate-leaved variety of *Cinchona officinalis* ranks fourth in its rate of growth. These facts are important in determining what species will be most profitable in cultivation, as the most hardy and luxuriant species, although yielding a bark somewhat inferior, may nevertheless be the most profitable plant to grow, in consequence of the greater produce

produce of bark in the same space of time; and this more especially when the species is hardy, and not liable to be injured by wild animals or adverse seasons, as is the case with the red bark, which does not appear to be injured by wild animals, even in situations where they entirely destroy the crown-barks. We have collected this season a large quantity of seeds, and again raised some very interesting hybrid varieties. *Cinchona* are particularly easy to hybridise, and in this way varieties may be obtained possessing the highest degree of excellence as regards the quality of the bark, the rapidity of the growth of the plant, its ability to endure extremes of seasons, etc.

To develop a variety in this way, such as will meet all requirements with regard to rapidity of growth, hardiness, and value of bark, will occupy some years; but the subject appears to be one well worth undertaking, and, if carefully carried out, could not fail in securing a plant much superior to any of our original species. About 50 acres of grass-land has been planted out this year with *Cinchona officinalis* and *Cinchona succirubra*. These plants continue to grow nearly as well on the grass-land as they do on the forest-land. One thousand five hundred plants of *Cinchona condaminea* have been planted out at three feet apart, in order to test what effect close planting may have upon the bark. When plants are placed close together, if not thinned out in a few years, the stronger-growing will overtop and destroy the weaker plants. During the year 4,000 plants of *Cinchona succirubra* and 2,000 of *Cinchona condaminea* have been mossed, in order to test the value of this process when applied on a large scale. All our species of chinchona, with the exception of *Cinchona lancifolia* and the Pitayo-barks, have produced abundance of seeds; these have been extensively distributed, and large numbers of plants are now produced from seeds. The weather during the past year has been most favourable for planting operations; we have had rain during every month of the year, except February. Our frost has not been severe, and done no damage whatever to the plants.

As suggested by Mr. Broughton, a number of trees have been manured with guano, sulphate of ammonia, and stable-manure, in order to ascertain what effect these manures have upon the secretion of alkaloids. The bark of the *Cinchona pahudiana* has very much improved in appearance. The *Cinchona lancifolia*, received from Java, flourishes well in this climate, and promises to be a very valuable species; this plant has somewhat the habit of *Cinchona officinalis*, but is of slower growth.

II. *Propagation*.—During the present year our stock of plants for filling up failures has been entirely raised from seeds; some of these have been successfully grown when sown in open beds and shaded with fern only. The more valuable species are now propagated by cuttings, such as the lanceolate-leaved variety of *Cinchona officinalis*, *Cinchona lancifolia*, and some of the more valuable of the yellow barks. The number of plants of these kinds were, on the 31st of March, as follow:—

Lanceolate-leaved variety of <i>C. officinalis</i>	-	-	-	1,563
<i>Cinchona lancifolia</i>	-	-	-	279
Pitayo-barks	-	-	-	123
The varieties of yellow bark	-	-	-	52,395
Total	-	-	-	54,360

III. *Cultivation*.—The system of cultivation described in previous reports has been carried out without variation in our operations of this season. All the species of chinchona have been found to thrive best when planted in the open; when the plants are first planted, they are protected for about a year with turf, wood, or fern. The plants originally planted as an experiment under the shade of living trees have made unsatisfactory growth, especially where the shade has been dense. During this season we therefore found it necessary to destroy the forest trees by depriving them of their bark.

IV. *Results obtained by private planters*.—Chinchona cultivation, as a private speculation, has, during the last two years, made very little progress in this district; the value of estates, whether of tea, coffee, or chinchona, have fallen greatly in the market, and become almost unsaleable: thus there is no inducement to speculators to invest their capital in these undertakings. Among the plantations which are still maintained may be mentioned Deva Sholah, the largest private plantation in Southern India, and next in extent to this the Ossington Estate, which contains nearly 400 acres of promising young chinchona plants. Among smaller estates, those of Mr. James Morgan, Dr. Colvin Smith, Colonel Scott, Captain Jennings, Colonel Fyers, and Mr. R. F. Phillips, deserve mention. A large quantity of our chinchona-seeds have been sent to private planters in the Himalayas and Ceylon, where private plantations appear to be making considerable progress.

V. *Chinchona, new varieties*.—Perhaps the most valuable variety in our possession is the lanceolate-leaved sort of *Cinchona officinalis*, from which Mr. Broughton has procured the unprecedented quantity of quinine, 10·13 per cent. of the weight of the bark. This variety is being propagated as rapidly as possible, and plants have already been distributed to private planters on the Neilgherries; also to Mr. Clark, Acting Superintendent, Chin-

chona Plantations, Bengal; and to Mr. Thwaites, Superintendent, Chinchona Plantations, Ceylon. These plants have yielded a few seeds, from which we have raised a number of seedlings; but as the seeds may or may not possess the properties of the parent plant, they have been kept separate. To perpetuate this plant in a manner so as to secure all its qualities, it can only be increased by cuttings, layers, or grafting.

The Pitayo barks, received from Mr. Cross during last year, have now been increased to 123, and we trust that during the present season we will be able to increase the varieties of this very valuable species to at least 1,000 plants. Some of the varieties of this species have the appearance of a hybrid between the red and crown barks; they are all rich in alkaloid, and appear to be hardy, and well suited to this climate. The new variety of *Chinchona calisaya*, presented to the Indian Government by Mr. Howard in the autumn of 1867, has now been increased to 1,300 plants; it is one of the most robust and free-growing of all the varieties of calisaya, and in consequence is a great acquisition to our collection. Of the plants raised from the calisaya seeds procured from Mr. Money, three of the varieties are very free-growing and hardy. Mr. Broughton has procured from the bark of these young plants 4.53 per cent. alkaloids. Among our crown-barks we have this year discovered a very interesting and apparently a new species, with soft downy leaves and a rough corky bark, but deficient in alkaloid. This plant was raised from the original seeds introduced by Mr. Cross, through Mr. Markham, and must have been gathered by accident. The hybrids raised from the seeds produced here have not attained a sufficient age to pronounce authoritatively upon the quality of the bark. The plants, however, are highly ornamental, some of the varieties very robust and free-growing, and no doubt may ultimately prove of value.

VI. *Formation of Alkaloids.*—This subject has been fully treated in the able reports of Mr. Broughton, the Government Quinologist, and it only remains for me to notice the very interesting fact that the yield of alkaloid in our barks still continues to increase with the age of the trees. Another fact noticed in my Report of the 27th April 1867—namely, that trees with “abundant and luxuriant foliage always yields more alkaloid than trees “with spare foliage;” also, that “trees with foliage freely exposed to light and air, “while their stems are under dense shade, are rich in alkaloids”—seems to be fully established by subsequent experience, and indicates a course of inquiry which may prove both interesting and profitable.

VII. *Establishment.*—I have much pleasure in being able to report the willing co-operation and the zeal with which my assistants have carried out the various duties entrusted to their care. Mr. Jamieson, the deputy superintendent, has now been 17 months in the country, and has, during that time, had charge of the gardens and the propagating establishment. Mr. Dawson, assistant superintendent in charge of Neddivattum, has carried out the various works connected with this plantation to my entire satisfaction. Mr. Rowson, the assistant superintendent in charge of Dodabetta Plantation, has taken a considerable interest in carrying out the operations entrusted to his charge. The head overseer, S. Narrainsawmy Naidoo, has been placed in charge of the Hooker and Wood Plantation under Mr. Dawson. In the office establishment, Mr. M’Nair, the office manager, has given every satisfaction in the performance of his duties.

VIII. *Progress of operations.*—No new buildings have been erected during the past year, the principal work performed being the completion of the roads, drains, and pitting of the Napier Estate at Neddivattum, and finishing the planting at Dodabetta. The establishments have been principally occupied in filling up failures and maintaining the plantations.

IX. *Botanical Gardens.*—During the present year no new works have been undertaken in the Botanical Gardens. Some very interesting plants, however, have been introduced and cultivated. The quinoa, a plant of great economic value, has been successfully cultivated in the gardens, and the seeds thus produced were distributed by the Commissioner to the native cultivators, and the plant is now pretty extensively grown throughout the district. The dry Burmese paddy, or rice, the seeds of which were kindly furnished to me by Captain Seaton, the Conservator of Forests, British Burmah, has been grown in the garden, but not successfully, the climate being apparently too cold. Among economic plants which grow luxuriantly may be mentioned the jalap, scammony, rice-paper plant of China, and the New Zealand flax. Our plants of the ipecacuanah still continue stunted and of unsatisfactory growth; I therefore took the opportunity of forwarding by Mr. Broughton two plants to Mr. Ferguson, the Assistant Conservator of Forests of Nelamboor. We are indebted to Mr. E. B. Thomas, late collector of this district, for seeds of numerous European trees and shrubs, as also for plants of the true olive, currants, and other fruit trees; to Major Beddome we are indebted for numerous new ferns and orchids; to Colonel Denison, for a fine collection of ferns and rose-cuttings; and to Mr. Deschamps, for a very select collection of ornamental flower-seeds. The various species of Japanese trees and shrubs, introduced in 1867, continue to grow well. Many of the more valuable and handsome species have been propagated to a considerable extent.

The

The following Table shows the distribution of plants and seeds from the garden for 1869-70 :—

MONTHS.	Fruit-trees.	Timber-trees.	Flowers and Shrubs.	Packets of Seeds.	Amount.
					<i>Rs. a. p.</i>
April - 1869 - - -	2	200	246	90	124 4 -
May - „ - - -	-	604	194	98	129 14 -
June - „ - - -	40	650	338	187	202 4 -
July - „ - - -	80	412	449	187	198 6 -
August - „ - - -	10	72	156	487	147 5 -
September „ - - -	-	220	286	272	127 6 -
October - „ - - -	108	301	595	234	247 12 -
November „ - - -	7	2	655	113	142 - -
December „ - - -	-	158	390	54	127 8 -
January - 1870 - - -	-	25	38	20	15 13 -
February - „ - - -	12	-	639	16	16 2 -
March - „ - - -	-	2,040	135	79	106 7 1
Total Distribution - - -	259	4,684	4,121	1,837	1,585 1 1

X. Tea plantation.—The tea plantation has not been further extended, but a large number of the more valuable varieties of the Assam and Chinese tea have been raised from cuttings, as only by this method of propagation can the qualities of the parent plant be perpetuated.

XI. Freshwater fish.—The experiment of acclimatising and breeding European freshwater fish has been most successful; the trout, tench (the common sort, and also the beautiful golden German variety), rudd, carp, gold and silver fish, are all increasing rapidly and making very satisfactory growth; we may, therefore, shortly hope to be able to stock the rivers of the district with these valuable fish.

Concluding remarks.—The extent of land having been planted to which the Government limit their operations in chinchona cultivation, the principal work now to be done is to maintain the plantation, to plant out annually a few acres of our recently introduced and more valuable varieties, and to collect the harvest of bark. In concluding this report, I beg to tender my gratified acknowledgments to the Madras Government for the liberal support they have given in bringing this national undertaking to its present satisfactory condition; to Mr. J. E. Howard, for his valuable contributions; and to Mr. Clements R. Markham, of the India House, for the active interest he has taken in the development of chinchona cultivation.

Ootacamund, 16 May 1870.

APPENDIX (A.)

SANCTIONED ESTIMATE COST of each CHINCHONA PLANTATION

PARTICULARS.	SUPERINTENDENT AND OFFICE ESTABLISHMENT.				NURSERY DEPARTMENT.				DODABETTA PLANTATIONS.			
	1860 to 1867.	1867-68.	1868-69.	1869-70.	1860 to 1867.	1867-68.	1868-69.	1869-70.	1860 to 1867.	1867-68.	1868-69.	1869-70.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Establishment, including salaries, &c.	42,151	8,804	8,672	8,532	23,945	4,684	3,636	2,516	40,154	8,044	4,284	2,760
Buildings - - -	-	-	-	-	4,000	100	250	800	10,660	1,600	1,950	700
Tool and store-rooms -	-	-	-	-	-	-	-	-	700	100	50	50
Coolies' quarters -	-	-	-	-	-	-	-	-	900	200	200	-
Felling - - -	-	-	-	-	-	-	-	-	2,850	-	1,000	-
Clearing and weeding, &c.	-	-	-	-	-	-	-	2,834	2,630	1,000	3,000	5,800
Pitting - - -	-	-	-	-	-	-	-	-	3,250	500	1,000	-
Carriage of plants -	-	-	-	-	-	-	-	-	1,700	700	500	300
Planting and shading	-	-	-	-	-	-	-	-	1,950	700	500	250
Trenching - - -	-	-	-	-	-	-	-	-	3,208	-	100	-
Inclosing - - -	-	-	-	-	756	-	-	-	6,900	-	150	-
Road-making - - -	-	-	-	-	-	-	-	-	2,825	-	250	150
Tools - - -	-	-	-	-	400	200	200	150	3,525	200	300	300
Contingencies - -	95	100	200	250	1,596	200	500	400	3,799	1,000	800	600
Clothing - - -	-	-	100	60	100	30	50	50	150	100	100	80
TOTAL - - -	42,246	8,904	8,972	8,842	30,797	5,214	4,686	6,750	85,201	14,144	14,184	10,990

PARTICULARS.	SUPERINTENDENT AND OFFICE ESTABLISHMENT.				PROPAGATION AND NURSERY DEPARTMENT.				DODABETTA PLANTATIONS.			
	1860 to 1867.	1867-68.	1868-69.	1869-70.	1861 to 1867.	1867-68.	1868-69.	1869-70.	1860 to 1867.	1867-68.	1868-69.	1869-70.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Establishment, including salaries, &c.	40,069	8,116	8,449	8,373	23,346	6,832	3,152	2,430	25,083	6,389	4,355	2,549
Buildings - - -	-	-	-	-	12,229	660	280	680	15,638	3,200	767	676
Tool and store-rooms -	-	-	-	-	-	-	-	-	430	200	-	30
Coolies' quarters -	-	-	-	-	-	-	-	-	1,058	350	137	-
Felling - - -	-	-	-	-	-	-	-	-	4,207	-	361	-
Clearing and weeding, &c.	-	-	-	-	-	-	-	1,000	3,578	1,160	4,300	5,000
Fitting - - -	-	-	-	-	-	-	-	-	5,492	1,011	2,567	-
Carriage of plants -	-	-	-	-	-	-	-	-	1,785	1,330	140	60
Planting and shading -	-	-	-	-	-	-	-	-	4,686	1,163	360	150
Trenching - - -	-	-	-	-	-	-	-	-	3,400	289	70	-
Inclosing - - -	-	-	-	-	-	548	-	-	4,707	590	40	-
Road-making - - -	-	-	-	-	-	-	-	-	6,295	644	120	50
Tools - - -	-	-	-	-	170	70	204	50	3,204	350	1,280	150
Contingencies - -	250	-	222	200	1,533	170	320	300	4,077	989	280	250
Excavating - - -	-	-	-	-	-	-	-	-	450	644	-	-
Clothing - - -	-	-	64	67	-	54	75	43	-	120	80	50
Various - - -	-	-	-	-	-	-	352	-	-	1,900	310	-
TOTAL - - -	40,319	8,116	8,785	8,640	37,278	8,334	4,388	4,503	84,090	20,329	15,167	8,960

APPENDIX (A.)

from Commencement of Operations to 31st March 1870.

	NEDDIVUTTUM PLANTATIONS.				PYKARA PLANTATIONS.				MAILKOONDAH PLANTATIONS.				TOTAL.
	1861 to 1867.	1867-68.	1868-69.	1869-70.	1862 to 1867.	1867-68.	1868-69.	1869-70.	1863 to 1867.	1867-68.	1868-69.	1869-70.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1	70,300	17,120	4,872	2,928	20,471	3,036	1,440	1,800	12,945	4,376	1,320	660	2,99,450
2	14,630	2,500	2,000	1,500	3,530	-	400	700	4,325	200	400	300	50,545
3	650	250	100	80	975	200	100	50	675	100	50	40	4,170
4	3,000	200	300	-	1,300	150	100	-	950	-	70	-	7,370
5	7,700	-	1,500	-	3,950	500	1,500	-	7,950	300	1,000	-	28,250
6	7,550	1,500	4,000	8,800	3,650	500	3,000	4,900	1,700	100	2,000	4,000	56,964
7	8,300	500	2,000	-	2,600	500	1,000	-	1,700	300	1,000	-	22,650
8	3,200	1,000	500	400	1,000	150	500	350	350	100	200	150	11,100
9	3,250	1,000	500	450	2,500	150	500	350	100	100	200	150	12,650
10	6,000	-	200	-	9,950	-	100	-	1,792	-	50	-	21,400
11	5,850	-	300	-	1,500	-	200	-	1,825	-	50	-	17,531
12	3,070	-	356	300	2,600	-	200	150	3,108	-	50	50	13,109
13	4,382	400	400	350	2,382	180	200	150	2,441	100	100	100	16,460
14	6,934	1,600	1,000	2,500	3,396	300	300	450	1,896	400	200	300	28,816
15	200	200	150	150	50	70	50	70	50	100	50	40	2,000
16	1,45,016	26,270	18,178	17,458	59,854	5,736	9,590	8,970	41,807	6,176	6,740	5,790	5,92,465
	NEDDIVUTTUM PLANTATIONS.				PYKARA PLANTATIONS.				MAILKOONDAH PLANTATIONS.				TOTAL.
	1861 to 1867.	1867-68.	1868-69.	1869-70.	1862 to 1867.	1867-68.	1868-69.	1869-70.	1863 to 1867.	1867-68.	1868-69.	1869-70.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
17	54,888	15,861	5,993	2,532	7,509	1,686	1,132	1,419	5,692	2,163	670	480	2,39,213
18	18,404	2,117	1,024	900	1,683	87	773	620	2,182	375	426	100	62,821
19	1,469	-	35	50	845	-	20	20	300	-	-	20	3,419
20	3,650	-	309	-	1,900	-	240	-	250	-	125	-	8,019
21	7,263	720	1,244	-	5,750	436	1,350	-	3,251	101	1,600	-	26,283
22	5,600	1,614	9,882	7,686	5,697	408	5,902	4,000	2,865	597	4,087	3,000	66,376
23	7,651	859	6,465	-	2,955	660	2,632	-	1,728	856	1,984	-	34,860
24	3,811	849	129	80	1,215	264	125	60	150	441	140	50	10,629
25	4,877	1,078	330	200	915	426	344	150	250	445	294	100	15,768
26	6,491	-	151	-	2,000	35	30	-	400	175	-	-	13,041
27	3,490	887	90	-	1,629	156	40	-	1,050	-	30	-	13,257
28	5,457	100	70	100	3,066	275	30	50	2,199	90	32	50	18,628
29	3,757	441	1,300	300	2,950	50	700	100	1,350	81	500	50	17,057
30	5,722	978	460	450	1,160	207	257	190	610	190	150	116	19,081
31	1,105	-	-	-	-	-	-	-	-	-	-	-	2,930
32	-	159	100	80	-	38	80	40	-	85	40	10	1,135
33	-	2,250	326	-	-	200	190	-	-	235	60	-	5,823
34	1,33,725	27,913	27,908	12,378	39,274	4,928	13,845	6,649	22,227	5,784	10,138	3,976	5,57,699

W. G. McIvor, Superintendent,
Government Chinchona Plantations.

APPENDIX (B.)

METEOROLOGICAL OBSERVATIONS from 1st April 1869 to 31st March 1870, made on the Government Chinchona Plantations at *Neddivattum*.

MONTHS.	Monthly Mean of Dry Bulb Hygrometer.				Monthly Mean of Wet Bulb Hygrometer.				Minimum observed during the Month.	Rainfall.			
	7 a.m.	2 p.m.	6 p.m.	Daily Mean.	7 a.m.	2 p.m.	6 p.m.	Daily Mean.		Inches.	Cents.	Days With Rain.	Days Without Rain.
April 1869 -	63.23	74.60	69.70	69.17	56.80	65.40	62.66	61.62	58.00	1	35	4	26
May " -	62.48	75.12	69.77	69.12	64.38	67.54	64.12	65.34	59.96	5	41	17	14
June " -	59.26	64.63	59.56	61.18	54.83	62.93	59.66	59.14	51.66	20	03	25	5
July " -	59.45	61.61	55.48	58.84	58.48	63.32	57.58	59.76	56.57	32	54	28	3
August " -	59.06	65.70	60.96	61.90	57.90	64.03	59.96	60.63	56.29	18	29	30	1
September " -	59.10	66.43	62.20	62.91	64.36	63.56	59.70	62.54	56.20	12	77	26	4
October " -	56.74	62.25	63.09	60.69	53.96	59.39	56.06	56.47	52.00	-	07	1	30
November " -	57.63	61.96	59.40	59.66	54.20	58.03	56.10	56.11	52.13	-	63	5	25
December " -	57.16	69.87	64.38	63.80	53.48	58.93	55.12	55.84	52.70	-	-	-	31
January 1870 -	51.70	63.03	59.67	58.13	54.70	59.64	54.83	56.39	52.96	-	-	-	31
February " -	56.21	75.92	69.53	67.22	53.39	62.67	54.67	56.91	48.00	-	-	-	28
March " -	55.16	71.22	65.05	63.81	52.06	59.16	56.00	55.74	44.85	1	28	5	26
TOTAL - - -	-	-	-	-	-	-	-	-	-	92	37	141	224
Annual Mean -	58.09	67.69	63.23	63.03	56.54	62.05	58.03	68.87	53.40	-	-	-	-

Ootacamund, 16 May 1870.

W. G. McIvor,
Superintendent of Government Chinchona Plantations.

APPENDIX (C.)

METEOROLOGICAL OBSERVATIONS from 1st April 1869 to 31st March 1870, made at the Government Gardens, *Ootacamund*.

MONTHS.	Monthly Mean of Dry Bulb Thermometer.				Monthly Mean of Wet Bulb Thermometer.				Maximum observed during the Month.	Rainfall.			
	7 a.m.	2 p.m.	6 p.m.	Daily Mean.	7 a.m.	2 p.m.	6 p.m.	Daily Mean.		Inches.	Cents.	Days With Rain.	Days Without Rain.
April 1869 -	57.00	72.05	61.70	63.58	53.20	60.90	57.20	57.10	79.28	4	54	8	22
May " -	58.05	71.26	61.53	63.61	55.32	62.37	58.21	58.68	73.90	6	37	16	15
June " -	55.67	62.29	56.33	58.10	54.54	60.00	56.62	57.05	65.22	5	41	24	6
July " -	54.36	62.73	56.77	57.95	54.14	60.09	55.82	56.68	65.22	4	91	23	8
August " -	55.41	64.88	57.35	59.21	54.65	61.71	56.53	57.63	68.67	4	82	20	11
September " -	54.91	66.39	56.83	59.38	54.09	62.13	55.61	57.28	69.11	2	37	16	14
October " -	53.92	65.29	56.79	58.67	52.79	60.71	55.21	56.24	68.87	5	38	8	23
November " -	52.18	62.41	54.41	56.33	51.00	58.59	53.05	54.21	65.79	4	44	15	15
December " -	53.30	67.00	55.57	58.62	49.91	59.30	53.65	54.29	69.73	3	28	12	19
January 1870 -	53.41	66.65	55.59	58.55	47.41	57.82	50.53	51.92	70.92	-	53	3	28
February " -	52.29	70.93	56.79	60.00	45.57	57.14	49.86	50.86	73.35	-	-	-	28
March " -	55.11	69.44	58.06	60.87	51.00	60.94	53.50	55.15	74.21	2	25	5	26
TOTAL - - -	-	-	-	-	-	-	-	-	-	44	30	150	215
Annual Mean -	54.63	66.78	57.31	59.57	51.97	60.14	54.65	55.59	70.36	-	-	-	-

Ootacamund, 16 May 1870.

W. G. McIvor,
Superintendent of Government Chinchona Plantations.

Enclosure 2, in No. 1.

From the Commissioner of the Neilgherries to the Secretary to Government, Revenue Department, Fort Saint George; dated Ootacamund, 14th September 1870, No. 46.

I HAVE the honour to forward the report of the Superintendent Government Chinchona Plantations for the half-year ending 31st July 1870.

2. I regret the delay in forwarding the report, but the very unsatisfactory result of the half-year's propagation rendered necessary a reference to the Superintendent, whose reply, dated 10th September, I enclose.

3. In my letter to Government of the 5th March, No. 18, forwarding the previous half-yearly report, I stated, on the authority of the Superintendent, that since the receipt of the Government Order, 9th November 1869, No. 2,936, attention had been devoted to the Lanceolate-leaved *C. Officinalis* * and the *C. Pitayensis*, and that they were being propagated as fast as possible.

* The valuable variety discovered by Mr. Broughton.

4. I regret to say, by the return now forwarded, that this appears not to have been the case. None of the *Officinalis*, only 161 of the *Pitayo*, and 1,500 of the *Calisaya* varieties, have been propagated during the half-year—a highly unsatisfactory outturn, considering that there are six propagators on the establishment.

From the Superintendent Government Chinchona Plantations to the Commissioner of the Neilgherries; dated Ootacamund, 10th September 1870, No. 225.

IN reply to your letter of the 23rd ultimo, No. 162, I have the honour to inform you that 1,661 Chinchona plants of the most valuable kinds have been propagated during the half-year ending 31st July last—viz., 161 of *Pitayo*, and 1,500 of the best *Calisaya* varieties. This result is certainly unsatisfactory. Mr. Jamieson has hitherto had charge of the propagation of the *Pitayo* and Lanceolate-leaved Chinchonas, and I regret the want of success in the management of these plants now renders it necessary to remove the propagation from under his care.

2. With reference to paragraph 2 of your letter under reply, I beg to inform you that the 3,500 plants were planted out on the Pykara and Neddivuttum Plantations. All these plants were of the valuable *Calisaya* varieties.

REPORT of the Number, Distribution, and Condition of Chinchona Plants on the Neilgherries, for the Half-year ending 31st July 1870.

Species.	Botanical Names.	Commercial Names.	Number of Plants.	Value per Lb. of Dry Bark in the London Market.	
				s. d.	s. d.
1	<i>C. Succirubra</i> - - - -	Red bark - -	1,215,963	2 6	to 8 9
2	<i>C. Calisaya</i> - - - -	Yellow bark - -	41,895	2 10	,, 7 -
	<i>C. Calisaya Frutex</i> - - - -				
	<i>C. Calisaya Vera</i> - - - -				
3	<i>C. Officinalis</i> .	Original loxa bark -	1,183,159	2 10	,, 7 -
	<i>C. var. Condaminea</i> - - - -				
	<i>C. var. Bonplandiana</i> - - - -				
	<i>C. var. Crispa</i> - - - -				
4	<i>C. Lanceifolia</i> - - - -	<i>Pitayo bark</i> - -	279	1 8	,, 2 10
5	<i>C. Nitida</i> - - - -	<i>Genuine grey bark</i> -	2,786	1 8	,, 2 9
6	<i>C. Species without name</i> - - - -	<i>Fine grey bark</i> -	8,500	1 8	,, 2 10
7	<i>C. Micrantha</i> - - - -	<i>Grey bark</i> - -	46,730	1 8	,, 2 9
8	<i>C. Peruviana</i> - - - -	<i>Finest grey bark</i> -	3,389	1 8	,, 2 10
9	<i>C. Pahudiana</i> - - - -	<i>Unknown</i> - -	425	-	Unknown.
10	<i>C. Lanceolate-leaved variety of</i>	<i>Seedlings</i> - -	1,100	-	-
	<i>C. Officinalis</i> .	<i>Rooted cuttings</i> -	463	-	ditto.
11	<i>C. Pitayo, from the seeds sent by</i>	<i>Seedlings</i> - -	196	-	-
	<i>Mr. Cross.</i>	<i>Rooted cuttings</i> -	88	-	ditto.
TOTAL Number of Plants - - -			2,596,837		

CORRESPONDENCE RELATING TO

TABLE showing the Growth of the different Species of Plants planted out in the Plantations, for the Half-year ending 31st July 1870.

No. of Plants.	Species.	Where Planted.	When Planted.	Maximum Growth.	Average Growth.	Height of the tallest Tree.	Girth near the Ground.
				<i>Inches.</i>	<i>Inches.</i>	<i>Feet.</i>	<i>Inches.</i>
12	C. Succirubra - -	Neddivuttum -	30 Sept. 1862	23	14	26	34½
12	C. Micranthra - -	- ditto - -	" "	18	13	24½	26
11	C. Officialis - -	Dodabetta -	" 1863	16½	8½	18½	13½

TABLE showing the Propagation, Distribution, &c. of Plants and Seeds during the Half-year ending 31st July 1870.

DATE.	Total Number of Plants Propagated.	Total Number permanently Planted out.	Total Number of Plants distributed to Private Individuals.	Total Quantity of Seeds distributed.
February 1870 - - - -	—	—	—	—
March " - - - -	340	—	—	—
April " - - - -	261	—	—	6
May " - - - -	450	—	108	—
June " - - - -	300	1,200	524	2
July " - - - -	310	2,300	—	—
	1,661	3,500	632	8
Previously - - - -	2,595,176	1,148,424	178,605	295
GRAND TOTAL - - -	2,596,837	1,151,924	179,237	303

REMARKS.

The number of plants permanently planted out in the plantations is 3,500, making the total 1,151,924.

The increase by propagation is 1,661, the monthly average being 277, making the total 2,596,837.

The number of plants distributed to private individuals is 632, giving the total distribution of 179,237.

Eight ounces of Chinchona seeds have also been gratuitously distributed, making the total 303 ounces.

Ootacamund, 18 August 1870.

Enclosure 3, in No. 1.

ORDER of the Government of Madras, 21st December 1870.

THE Commissioner of the Neilgherries, in submitting Mr. McIvor's report for 1869-70, testifies generally in favour of the results attained during the year, but, on the other hand, calls attention to the serious decline of the Mailkoondah plantation, the state of which contrasts most unfavourably with the outlay expended on it.

2. The expense of the plantations has varied considerably: the Pykara estate having cost 215 rupees, the Dodabetta plantation 346 rupees, and that at Neddivuttum 448 rupees per acre; but the cost of the Mailkoondah plantation (562 rupees per acre) has exceeded that of all the rest. The cause of this large excess and of the unsatisfactory condition of the estate should be explained. The Government do not now consider it expedient to incur any further expense on the Mailkoondah plantation; but they wish to have Mr. McIvor's opinion as to the best mode of utilising the outlay already incurred, and to be informed what

what extent of land has been cleared and prepared for planting. Mr. McIvor should also explain why the buildings have not been kept in repair.

3. The Government regret that in another important respect the results of the year have not been satisfactory. In his letter dated 14th September 1870, No. 46, Mr. Breeks remarks on the very unfavourable results of propagation during the half-year ending 31st July 1870; and, in addition to this, he observes that "none of the *Officinalis*, only 161 of the Pitayo, and 1,500 of the Calisaya varieties have been propagated during the half-year "referred to."

4. The Government regret the unsatisfactory nature of this report, and they are unable to account for Mr. McIvor's non-compliance with the marginally noted orders, in which it was enjoined that the planting of red-bark trees should be discontinued in favour of the varieties mentioned by Mr. Breeks. An early and full explanation should be sent in by the Superintendent.

Government Order, dated 19th June 1869.
Government Order, dated 9th November 1869.
Government Order, dated 22nd February 1870.

5. In other respects there is much that is encouraging to note regarding the state of the plantations. The aggregate increase by planting out during the year was 254,367, and by propagation 17,526—the former number representing an increase of more than 100,000 over the number planted in the preceding year. The Government are gratified to learn that the trees are now sufficiently advanced to permit of the supply to the Government Quinologist of 100,000 lbs. of fresh bark per annum.

6. Last year his Excellency the Governor in Council recorded with satisfaction the fact that the lanceolate-leaved variety of *C. Officinalis* had yielded the then unprecedentedly large proportion of 9·75 per cent. of quinine. The yield of this bark of this variety has increased with its growth, and during the year under review has yielded 10·13 per cent., a result which fully justifies Mr. Broughton's anxiety that the propagation of the "lanceolate-leaved *C. Officinalis*" should be extended.

7. Several experiments have been conducted during the year, in order to determine the conditions most favourable to the growth of chinchona; of these, the most important is the "mossing process," to which 6,000 trees have been subjected. Manuring the plants with guano, sulphate of ammonia, and stable-manure has also been tried. The results of all these experiments should be carefully noted and reported.

8. The extent of land originally sanctioned for chinchona-planting (1,200 acres) has now been fully occupied; but it is estimated that about 1,000 acres, adjoining the three outlying plantations, are still available for the same purpose, if required. The Government do not consider it advisable that the plantations at Pykara and Mailkoondah should be increased in size, and any additions to those at Dodabetta and Neddivuttum must be limited to the cultivation of those varieties of chinchona the superiority of which has been and may hereafter be determined by Mr. Broughton's analysis. The Commissioner is requested to state the area of land available at Neddivuttum, and what expense will be involved in taking it up.

9. From Appendix A. of the Report, it appears that the actual expenditure on the chinchona plantations during the year under review was 45,106 rupees, being 13,684 rupees less than the Budget Estimate (58,790 rupees).

10. The report on the Botanical Gardens does not specify with sufficient distinctness the work which has been performed during the year under review. The freshwater fish introduced from Europe by Mr. McIvor have thriven, and largely increased in number. The lake at Ootacamund has already received a stock of them, and there is every reason to hope that some, if not all, of the different species will succeed in the Hill streams.

11. The Government approve of Mr. Breeks's suggestion that the Government gardens should, in future, form the subject of a separate report from that relating to the chinchona plantations, and that details of the nature of those adverted to by the Commissioner in paragraph 10 of his letter* should be inserted in it.

* Dated 23rd May 1870.

Enclosure 4, in No. 1.

From the Government Quinologist to the Acting Secretary to Government, Revenue Department, Fort St. George; dated Ootacamund, 31st August 1870.

IN the following pages I have the honour to communicate some results obtained connected with the subject of the employment of the chinchona febrifuge in this country, also some statistical considerations having reference to the future yield of the plantations.

2. In the original instructions* I had the honour to receive from the Home Government, I am told (in paragraph 3) that it was required "to ascertain the preparation of the febrifuge which will combine cheapness with efficacy in the greatest degree" (and in paragraph 4), "and, finally, it will be expected from the chemist that he should, through his investigations, enable Her Majesty's Government to arrive at a decision with respect to

* Letter from the Under Secretary of State, dated 22nd September 1866.

"the best and cheapest method of preparing the febrifuge for use among the labouring classes of the natives of India. He will also be required to consider the questions connected with the manufacture of the chinchona febrifuge for the use of hospitals and troops in India."

3. In a report appearing in Proceedings of Madras Government, Revenue Department, No. 240, of 13th December 1867 (paragraph 10), I had the honour to propose a preparation which I then believed would combine the qualities desired in the febrifuge to be extensively used in this country. During the subsequent two years I prepared small quantities of this substance for medical trial in my experimental laboratory, and finding the results of its medical employment as encouraging as I expected from its composition, I commenced in January last to manufacture it on a larger scale in the small manufactory then just erected near the gardens at Ootacamund.

4. Up to the present date about 70 lbs. of this febrifuge have been prepared and supplied to the medical stores. As it consists of the alkaloids (mixed as they naturally occur in the plant) precipitated from solution in an uncrystallised but tolerably pure state, it has been appropriately named by Dr. Mackenzie "Amorphous Quinine," by which name I trust it may henceforward be called. The results of its actual medical use seem to have been very satisfactory. I learn from the Medical Inspector General that he intends to submit these results to Government, with his own opinion of the value of the febrifuge. On general grounds, I strongly recommend the extensive adoption of amorphous quinine as a febrifuge that appears to meet the full requirements of the case; but it is of course on the medical testimony to its qualities that the decision must finally rest. I now await the opinion and directions of Government on this point.

5. I find that the bark of *C. Succirubra*, of which half of the plantations consist, is exceedingly well adapted for the preparation of amorphous quinine. I have had occasion in several foregoing reports to point out certain disadvantages which attach to this bark for the preparation of pure crystalline salts of the respective alkaloids. These do not, however, in the least affect the manufacture of amorphous quinine, while the large total yield of the bark renders it particularly suited to the extensive and cheap manufacture which it appears to me should be established on the Neilgherries. Hence, in all plans and considerations connected with the preparation of amorphous quinine, I shall only consider the bark of *C. Succirubra*. The bark of *C. Officinalis* will find its best application in the manufacture of pure crystalline sulphates of the alkaloids, either in this country or in Europe.

6. In order to produce as cheap a product as possible, it will be necessary to manufacture on the spot on which the bark grows. The cost of conveying the bark from Neddivuttum to Ootacamund and the price of fuel at the latter place entail so much expense, that there can be no question as to the expediency of working up the bark on the plantations themselves. The irregular and defective supply of bark has been the source of the main difficulty in carrying on the manufactory at Ootacamund. I reckon that when working at Neddivuttum, with a rough but effective "plant," with bark of mean quality, and preparing 800 lbs. of alkaloid per annum, the cost of the same (including that of the bark) will be about one rupee per ounce. A large outturn would still further diminish the price.

7. Having had in view for some time the eventual manufacture of considerable quantities of amorphous quinine, I have taken some pains to estimate the amount of that substance in the red barks of the plantations. My estimations were made last spring, and depend on data given in Appendix:—

Number of Trees.	Age.	Bark.	Quantity of Alkaloids contained in Lbs.
	YEARS.		Lbs.
19,500	7½	Trunk - - - -	1,833
"	"	Branch - - - -	815
29,400	6½	Trunk - - - -	2,095
"	"	Branch - - - -	605
45,800	5½	Trunk - - - -	2,310
"	"	Branch - - - -	860
68,650	4½	Trunk - - - -	3,205
"	"	Branch - - - -	1,105
73,430	3½	Trunk - - - -	1,468
"	"	Branch - - - -	279
152,050	2½	Trunk - - - -	632
"	"	Branch - - - -	156
TOTAL - - -			15,363

8. Thus at the present time the red barks alone of the Neilgherry Government plantations contain 15,000 lbs., or nearly seven tons, of a febrifuge which I learn is equal, or nearly equal, to ordinary quinine sulphate in efficacy. I cannot therefore think that it is premature to endeavour to prepare sufficient febrifuge to supply the hospitals and dispensaries during the forthcoming year.

9. In 1867 a considerable number of our oldest trees of red bark were cut down in order that the bark might be sent to England for sale. From the stumps have sprung vigorous shoots, that have at the present time attained a height of 12 to 15 feet. I recently collected a mean specimen of the bark of these shoots. Its analysis gave, in 100 parts of dry bark—

Total alkaloids	- - - - -	6·34
Quinine	- - - - -	1·37
Chinchonidine and chinchonine	- - - - -	4·97
Pure sulphate of quinine, obtained crystallised	- - - - -	1·14
" " chinchonidine, obtained crystallised	- - - - -	4·29

10. When it is considered that the shoots were but three years old, this analysis must be considered most satisfactory. It seems to justify the anticipation that coppicing will hereafter be an important means of cropping the plantations. This method has the further recommendation of furnishing excellent fuel without the necessity of destroying the sholahs. It appears to me to be very necessary that a considerable number of trees of seven years old should be cut down, in order that the method of coppicing should be tried, and the expenses, as compared with the plan of mossaing, be accurately determined.

11. I will assume that after a tree aged eight years has been cut down, that the shoots, after a lapse of eight years, will produce as much bark as the original tree, an assumption that will not under any circumstances entail a great error. The number of growing trees of red bark on the plantations is about 591,600. If an eighth part of these be annually cut down, the bark of 73,955 trees will be annually available. This amount will yield no less than 10,323 lbs. of mixed alkaloids, a quantity which must be in considerable excess of any possible demand for febrifuge in this presidency. The same number of trees will yield 1,730 cwts. of dry red bark, of which about 1,400 cwts. would be fit for export. This latter amount would be about a seventeenth part of the quantity of bark annually imported from South America into England.

12. I conceive that the foregoing arithmetical considerations justify the conclusion that the extension of chinchona planting by Government has already reached its limit. From the returns of the plantations here there is a gross total of one and a quarter million of trees planted. The returns of the plantations in Bengal give 1,465,999 trees planted. In Java the returns give 1,532,148. The private plantations on these hills contain at least a million trees, and as many more may be certainly reckoned for the private plantations in the Himalayan valleys. I do not possess definite information of the numbers planted in Ceylon, but they number at least 250,000 trees. In Jamaica 70,000 trees, principally red barks, are planted, and flourishing exceedingly. At St. Helena, in 1868, 5,000 trees were planted, and it was expected in a year to have 20,000 planted. At Oratava, in Teneriffe, the cultivation is commenced with success. On the Organ mountains, in Brazil, the same success is attained. The only place where the cultivation has apparently been unsuccessful is at Chiffa, in Algeria, where the cold winds appear to have at length nearly extinguished the plants, originally supplied from this presidency.

13. Altogether, it may be estimated that 7,000,000 of chinchona trees are under cultivation in various parts of the world, and that the number is increasing annually. It appears, therefore, that unless it be to supply an urgent local want, there can scarcely be further necessity for Government pressing chinchona cultivation in other parts of this presidency. It is most desirable for the interests of the cultivation that the demand for bark be not exceeded.

14. It would be of considerable service if a probable estimate could be formed of the amount of febrifuge that would be consumed in this presidency if the price were reduced to one rupee the ounce. I am informed that the mean annual consumption at the Medical Stores, for the five years ending 31st March 1867, was 344 lbs. of quinine sulphate and 910 lbs. of chinchona bark, or, in round numbers, 475 lbs. of quinine sulphate altogether. I am informed* by some authorities that four times, and by others that 10 times, the amount would be consumed if the cost were reduced. It appears to me that it would be well worth while to endeavour to procure some definite information on this point before manufacture be commenced on an extensive scale.

15. If pure crystallised sulphate of quinine be prepared in this country, the *C. Officinalis* and *C. Calisaya* will be the fittest sources. I have hitherto made no attempt to manufacture pure sulphates, except on a small scale. The red bark, from the difficulty

* I learn from the Medical Inspector General that the amount used last year was 700 to 800 lbs., and that the demand is annually increasing.

of purification, would be a comparatively costly source; and the trees of *C. Officinalis* are scarcely enough developed to take their bark except at a loss. I propose eventually to make use of the small manufactory at Ootacamund for an attempt at the preparation of pure sulphate of quinine from the crown-barks of the Dodabetta plantations, though whether this salt can be profitably made in this country there are at present no trustworthy experimental data to determine. The question will be attacked as soon as a supply of suitable bark is available; I am already in possession of fit apparatus for this purpose.

16. On the presumption that the Report of the Medical Inspector General above mentioned, respecting the results of the employment of amorphous quinine, will be found satisfactory to Government, I have the honour to propose the following request:—

17. That I be permitted to expend all the savings I can effect out of my total sanctioned budget grant, in converting, as far as possible, the now-disused gaol at Neddivuttum into a suitable place for performing at least the preliminary extraction of the bark on the spot, in order to avoid the cost of carriage of bark to Ootacamund.

18. I would also advise that a certain number of trees of those planted in 1863 be cut down when the season of maximum yield arrives, in order to test practically the method of cropping the plantations by coppicing. I would also recommend that a considerable part of the best bark thus obtained be sent to England for sale in open market, and the remainder be worked up in the alkaloid manufactory. As soon as a sufficient amount of our admirable crown-bark is fit for cropping, I think that a supply should also be sent to the English market, as I am convinced that its good quality will give a reputation to the Indian chinchona barks.

19. In accordance with Government Order, No. 426, of 19th February 1869, a considerable number of trees were treated by Mr. McIvor's mossing process, in order that the practical and financial consequences might be determined on a sufficient scale. I presume, from the tenor of the various orders on the matter, that Government intend that I should examine and report on the results of the experiment. It appears to me that in order to arrive at a definite decision as to the practical value of the process, which will require an accurate consideration of the entailed expenses, the matter might be advantageously referred to a third person. I propose, therefore, that the various results be communicated to the Commissioner of the Neilgherries as they are obtained, who will thus be able to give Government an unbiassed opinion of the gross result, and who can be referred to on the occurrence of any difference of opinion in the conduct of the experiment. If Government think fit, I will, therefore, report on this subject to Mr. Breeks instead of to Government.

APPENDIX.

Data of Estimates concerning C. Succirubra.

Trees of the planting of 1862 yielded a mean per tree of 3.9 lbs. of trunk bark, containing 67.13 per cent. of water, and 4.6 lbs. of branch bark, containing 70.79 per cent. of water. Trunk bark dry contained 7.55 per cent. alkaloids; branch bark, 3.2 per cent. of alkaloids.

2. Trees of the planting of 1863 yielded a mean of 3.6 lbs. of trunk bark, containing 67.88 per cent. water, and 2.8 lbs. of branch bark, containing 71.87 per cent. of water. Trunk bark contained 6.23 per cent. of alkaloids in dry bark; branch bark, 2.63 per cent. alkaloids.

3. Trees of the planting of 1864 yielded a mean of 1.775 lbs. of trunk bark, containing 60.78 per cent. of water, and 1.3 lbs. of branch bark, containing 51.64 per cent. of water. Bark was allowed to get partially dry before weighing. Trunk bark contained, when dry, 7.33 per cent. of alkaloids; branch bark, 3.07 per cent.

4. Trees of the planting of 1865 yielded a mean of 2.66 lbs. of trunk bark, containing 73 per cent. of water, and 2.83 lbs. of branch bark, containing 75 per cent. of water. Trunk bark contained 6.49 per cent. alkaloids when dry; branch bark, 2.28 per cent.

5. Trees of the planting of 1866 yielded a mean of 0.84 lbs. of trunk bark, containing 66.94 per cent. of water, and 0.66 lbs. of branch bark, containing 73.68 per cent. of water. Trunk bark when dry contained 6.61 per cent. of alkaloids; branch bark, 4.96 per cent.

6. Trees of the planting of 1867 yielded a mean of 0.68 lbs. of trunk bark, containing 73.09 per cent. of water, and 0.37 lbs. of branch bark, containing 65.67 per cent. of water. Trunk bark contained 2.21 per cent. of alkaloids, and branch bark 0.81 per cent.

Enclosure 5, in No. 1.

From the Commissioner of the Neilgherries, to the Secretary to Government, Revenue Department; dated Ootacamund, 2nd September 1870.

I ENCLOSE replies from Messrs. Broughton and McIvor to the inquiries of the Secretary of State in his Chinchona Despatch, dated 19th May 1870, No. 13, embodied in Proceedings of Government, Revenue Department, 11th July 1870, No. 27.

2. I requested the two gentlemen to record their opinions in the form of answers to the following queries:—

1. *What system of cropping the bark is the best?*

Two methods are proposed—firstly, barking the trees, and covering them with moss to induce a rapid reproduction of the bark; secondly, coppicing.

Mr. McIvor advocates the former. Mr. Broughton thinks that we have not yet sufficient data for deciding on the comparative advantages of the two methods, but he is “led to hold the opinion that a great part of the Neilgherry and the whole of the smaller plantations of Southern India will be advantageously treated as coppice.”

3. The information we have at present with regard to either mode is scanty. Mr. Howard, in his Analysis Reports,* supports Mr. McIvor’s statement that the yield of alkaloids is increased by the mossing process.

In one instance, however, he says: “The effect of the application of moss for a few months to No. 2 (*Succirubra*) does not show, as compared with the original unmossed bark of No. 3 (*Succirubra*), so much real advantage as might have been expected.”†

And again, reporting on the third harvest of renewed bark (*Succirubra*), he remarks: “I hoped to obtain a larger produce than last time, but was disappointed in finding a smaller amount of salts of quinine, namely, 6·15 per cent., against 8·45 per cent. in the specimen of renewed bark from the same tree on which I had the honour to report in February 1867.”‡

Mr. Broughton has reported that “the advantages of the mossing process applied to this bark (red bark), makes itself at once evident to the worker by the readiness and purity with which the sulphates crystallise.”§

4. The experiments, however, from which these results have been deduced have been necessarily conducted on a very limited scale, and in all cases refer to the bark of young and individual trees only. Moreover, as yet we have no information of the cost of mossing, nor do we know what amount of bark can be annually taken from a tree without injury to its growth.

I need hardly say that I do not share in the summary condemnation of the mossing process expressed by Mr. Clarke in his report to the Bengal Government, dated 10th February 1870, paragraph 27. He says: “Dr. Anderson has decided, after no very long experimenting, to have nothing to do with that process. About that decision there is no second opinion at Rungbee. Any person may, however, quickly decide it for himself in Calcutta.”

That the value of the mossing process for India should be decided by an experiment in Calcutta seems to me a most eccentric proposal. Moss is abundant on the Neilgherries, and the process is undergoing a careful and systematic trial, in accordance with Government Order, Revenue Department, 9th February 1869, No. 426. Until the results are known it will be well to defer judgment.

5. Messrs. Howard and Broughton’s reports point out, with regard to the yield of quinine, differences in the different varieties of chinchona, and in the same trees under different conditions.

Thus the percentage|| of quinine in the *Succirubra* appears to decrease with age; this is not the case with the *Officinalis*. Again, “the yield of alkaloids varies greatly with the vigour of growth, size of tree, and consequently with character of soil. The most vigorous and quickly-grown trees yield a far richer bark than the more stunted ones of the same age.”¶

These circumstances may have some bearing on the point under consideration, and may possibly render different methods of cropping the bark desirable with different varieties of chinchona and different plantations.

6. Between

* See Proceedings of Government, 27th September 1865; Mr. Howard’s Report, 15th June 1864; Proceedings of Government, 31st October 1865; Mr. Howard’s Report, 1st August 1865; and Proceedings of Government, 20th June 1867; Mr. Howard’s Report, 4th February 1867.

† Mr. Howard’s Report, 4th February 1867.

‡ Proceedings of Government, 5th August 1869; Mr. Howard’s Report, 1st September 1868.

§ Proceedings of Government, 12th April 1867; Mr. Broughton’s letter, 1st April 1867.

|| Paragraph 7, Mr. Broughton’s Report, 9th December 1869, in Proceedings of Government, Revenue Department, 22nd February 1870.

¶ Paragraph 6, Mr. Broughton’s Report, 9th December 1869, in Proceedings of Government, Revenue Department, 22nd February 1870.

6. Between the two methods of cropping proposed, I take it the question to be determined is, whether an acre of land will yield more alkaloids in a given time under the mowing than under the coppicing system; and if so, whether the increased yield more than covers the increased expense.

7. I would suggest that a certain number of trees of the same age of each variety of chinchona should be treated on each of the two systems. The bark harvested under this experiment might be annually sent home and sold, for the reasons given in paragraph 12 under.

In four years it would be evident which of the two systems was the best, and the experiment would be of practical value to many who have embarked in chinchona cultivation.

8. The second question is, *whether the bark should be manufactured in India, or sent home for sale; or whether a portion should be sent home and a portion worked up on the spot?*

Mr. Broughton is entirely of opinion that the amount of febrifuge required for use in India should be manufactured in this country, because the expense of drying, powdering, conveying the bulky bark home, and importing the manufactured alkaloids, are thereby avoided; because the process of manufacture can here be simplified and cheapened by employing *fresh* bark, and by preparing the alkaloids in a cheaper form than that of crystalline sulphates; and because the necessary materials are as readily and, with the exception of sulphuric acid, almost as cheaply procurable here as in England.

Mr. McIvor is unable to give a decided opinion, but imagines that it would be more economical for Government to sell their bark and purchase the alkaloids than to manufacture them.

9. Both gentlemen recommend that Government should send into the home market a considerable quantity of bark, so as to enhance the reputation of the India-grown barks, and remove certain prejudices arising out of occasional peculiarities in their appearances which may at first interfere with their sale.

10. The Inspector-General of Her Majesty's Indian Medical Department (Dr. Mackenzie, C.B., C.S.I.) reports to me that the future yearly requirements of the Madras Presidency may be put at 700 or 800 lbs. of alkaloids. Allowing the same for Bombay, and double for Bengal and the North of India, some 3,200 lbs. of alkaloids will be required annually.

11. For the reasons alleged by Mr. Broughton, I am of opinion that it will be more economical to manufacture in India.

12. In the interests, however, of those who have embarked in chinchona cultivation, the Government may well send home, as suggested by Messrs. Broughton and McIvor, about 3,000 lbs. of bark annually to accustom home-buyers to the Indian product.

There is often a difficulty in establishing a demand for an article which, although intrinsically superior, differs somewhat in externals from what brokers and buyers have been long accustomed to.

In sending bark of the different varieties home for sale, the Government might do good service.

This, however, should only continue for three or four years, or until such time as Indian bark finds its way home from private sources, for under no circumstances should Government, as an exporter of bark, enter into competition with private planters.

13. The third question is, *should the plantations remain permanently in the hands of Government for the supply of quinine in the hospitals and the distribution of seed and plants; or should the plantations be sold, as in the case of the Government tea plantations?*

"Mr. McIvor thinks that Government having firmly established this cultivation should "dispose of their plantations, and leave the further extensions to private enterprise," for the same reasons that induced the sale of the Government tea plantations; and he states that private planters are now quite able to supply the demand for plants and seeds without the aid of Government.

Mr. Broughton thinks that Government should retain as much of their plantations as will supply a febrifuge in a cheap form and sufficient for their wants, because Government being a large consumer of the produce will thus obtain it most cheaply, and because Government can only secure for the masses a supply of febrifuge at the *cheapest* price by retaining control over all stages of its production.

14. Mr. Broughton remarks that the case of the Government tea plantations is not a parallel one, because Government are not large consumers of tea, and had no object in introducing its cultivation but that of developing trade and agriculture, whereas in the case of chinchona these objects are secondary to that of ensuring a cheap and indigenous supply of an important medicine.

In support of his opinion he gives an estimate of the plant and working expenses for manufacturing here, annually, 800 lbs. of amorphous alkaloids.

He calculates that the cost of such alkaloids would be one rupee an ounce, that of imported quinine being at least three rupees.

15. It seems to me somewhat premature to decide *now* whether the Government should retain

retain the plantations permanently in their own hands and manufacture the alkaloids they want.

But, as far as I can see, I am of opinion that Government should retain possession of the plantations, at any rate for a considerable time longer, for reasons which I will give by-and-by; and by manufacturing for themselves they will, I think, for some years obtain their annual supply of alkaloids at a cheaper rate than if they imported them.

16. I am aware that it is seldom or never that Government can grow or manufacture so cheaply as private individuals, nor is the attempt generally desirable; but there are circumstances connected with the questions under consideration, which seem to me to make it exceptional. It is highly improbable that any alkaloid manufactory will be established in India except by Government. We have a gentleman on the spot, in the service of Government, whose scientific attainments excellently qualify him to introduce the manufacture; and, in my judgment, the most weighty argument for the Government retaining the whole process of production in their own hands will be found in the opportunity thereby afforded to the Government Quinologist for simplifying and cheapening the manufacture of an efficient febrifuge for the use of the population at large.

17. It is evident,* from the report of the Madras Chinchona Commission, that "the four alkaloids occurring in our barks are nearly equal in febrifuge power." If Mr. Broughton is successful in the preparation of a substance from them which can be conveniently administered, which is equal or nearly equal to quinine-sulphate in its medicinal effects, and which can be made so cheap as to be within reach of the million, the object of the introduction of chinchona cultivation into India, as described in the Secretary of State's Despatch, No. 27, 30th September 1875, will have been attained.

18. Still it may be said that Government, in the interests of the public, and for the furtherance of Mr. Broughton's experiments, might establish a manufactory, and yet sell their plantations, buying bark from private growers. This I am disposed to think will be the course ultimately taken. But for some time to come plantations will be wanted for the quinologist's experiments as to the influence of season, age, altitude, climate, and cultivation on the amount of alkaloids in the bark of the different varieties of chinchona.

The investigation of these and similar problems is of great moment and will take time to complete. The information when obtained will have an important effect in determining the conditions under which the various varieties of chinchona will repay cultivation.

19. No doubt the annual working expenses of the Neilgherry plantations have been heavy. To attain the object aimed at, namely, the introduction of chinchona into India, no expense has been spared; but the working charges now should be cut down to somewhat the same level as those on private estates, two or three extra hands being retained for propagation and for planting out more than, say, five acres of each new variety that may come to hand.

20. The fourth question is, *if you are of opinion that the plantations should be eventually sold, at what stage of their development should they be sold?*

Mr. McIvor thinks three or four years hence would be the best time to dispose of the plantations, when the youngest plants will be sufficiently established. Mr. Broughton is against the sale of the plantations, but thinks it possible that it may eventually be found that Government possess larger plantations than they require, and that it may be advisable to sell a part.

21. If it be determined to dispose of the plantations on the ground that Government have fulfilled their mission, and "firmly established chinchona cultivation in India,"† and that the further development of the industry may well be left to private enterprise, the mode, time, and place of sale most likely to fetch the best price have only to be considered.

†Mr. McIvor's letter enclosed, para. 4.

The Government chinchona trees have this advantage, that their growth is in advance of all others, and their bark by being first in the market will go off at present high rates. This advantage will be lost if the bark is not sent home and the sale of the plantations is deferred for several years.

22. As explained in my letter‡ to Government, submitting the Chinchona Superintendent's annual report for 1869-70, I am of opinion that it is not worth while incurring any further expense on the Mailkoondah plantation.

‡ 28th May 1870.

Up to the 31st March 1870, 42,175 rupees had been spent on this plantation, of which 75 acres have been planted out.

I take leave to refer to paragraphs 8 and 9 of my letter above quoted.

If my suggestion with regard to the Mailkoondah plantation be approved, the remain-
ing

* Mr. Broughton's Report, 28th November 1867; Proceedings of Government, Revenue Department, 13th December 1867.

ing plantations, which I would recommend the Government to retain possession of, would all be situated within easy reach of each other, and would consist as follows:—

	Acres.
Dodabetta - - - - -	375
Neddivuttum and Pykarrah - - - - -	750
	1,125

23. I add some general remarks. At page 141 of M'Culloch's Dictionary I see it recorded that "the sum expended by the Indian Government in the purchase of this "valuable medicine (quinine) is stated to exceed five lakhs annually." Considering this, it seems to me that the main intention of the chinchona undertaking will be incompletely carried out, unless India be placed in a self-supplying condition. I consider it both politically and economically desirable that the febrifuge employed in this country should be supplied from internal sources, more especially if the chinchona undertaking be intended to have the effect of providing "an abundant supply of this febrifuge at so "cheap a rate as to be within the means of the population at large, the coolies employed "on works and private plantations, the small cultivators, their wives and families," as stated in the Secretary of State's Despatch above mentioned. I can see no probability of this intention being speedily realised, unless Government lead the way in every stage of production.

24. I ought to say that it was altogether at my instance that Mr. Broughton inserted in his report an estimate of the plant and working expenses for manufacturing some 800 lbs. of alkaloids annually.

I suggested this, not under the idea that the time had come for applying to Government to sanction such an outlay, but in order to have on record in some data towards forming an opinion as to the desirability of Government becoming by-and-by manufacturers of their own alkaloids.

25. For the present I am quite of Mr. Broughton's opinion, as expressed in his report,* dated 28th November 1867, namely, that he should steadily persevere in his endeavours "to find a process which would yield the alkaloids in a state of sufficient purity by simple "means," "and to produce an efficient febrifuge which can be prepared by a method "which an ordinary apothecary would have little difficulty in learning to follow." Since January last he has already produced 70 lbs. of such a substance, and if this prove completely successful in the Medical Department, he can, as he suggests, "extend the manufacture, and, as opportunity offers, include that of crystalline sulphates."

26. Working steadily with this end in view, Mr. Broughton will, in the course of a year or two, be able to supply reliable data:—

- (1.) As to the best mode of cropping the bark.
- (2.) As to the most favourable conditions for the growth of the several varieties of chinchona.
- (3.) As to the extent of plantations that will have to be retained by Government in order to supply the quantity of febrifuge they require.
- (4.) As to the cost of establishing a Government manufactory equal to the supply of India's wants.

With reliable information before them on these points, it will be easy for Government to decide whether or no it be desirable to retain the plantations in their own hands, and to establish a manufactory at Ootacamund, or Rungbee, or elsewhere.

Enclosure 6, in No. 1.

From the Government Quinologist, to the Commissioner of the Neilgherries; dated
Ootacamund, 8th August 1870.

I AM in receipt of your letter, No. 140, of 23rd July 1870, which reiterates the inquiries contained in the Despatch of the Secretary of State, which appeared in Proceedings of Government, Revenue Department, No. 27, of 11th July 1870. To these inquiries I have the honour to append answers to the best of my opinion and present knowledge.

INQUIRY I.—What systematic course would you recommend with reference to procuring and utilising annually the very large quantity of febrifuge alkaloids stored in the bark of the trees?

I am of opinion that our present experience has hardly been sufficiently matured to permit the laying down of a definite and unalterable system of cropping the plantations. There are two modes, on the results of whose trial the method ultimately adopted of harvesting will depend. These are, first, the method of mossaing the trees, of taking the bark from the living tree, and allowing it to renew under moss, advocated by Mr. McIvor; second, the method of coppicing. The first of these methods has hitherto been carried

* Proceedings of Government, Revenue Department, 13th December 1867.

carried out on so small a scale that the cost and financial advantages have not been ascertained. At my recommendation the Government issued orders (G. Os., 2,453 of 22nd September 1868, and No. 426 of 19th February 1869) that a certain considerable number of trees should be treated by moss. This was done in May 1869 and following months, and the results obtained, together with the cost of the same, will furnish trustworthy data for determining whether the method of mossing be finally adopted. The method of coppicing appears a very suitable mode of cropping the plantations. In 1867 some hundred trees of *C. Succirubra* were cut down, in order that their bark might be sent to the English market. In the early part of this year the vigorous shoots that had sprung from the stumps had reached a height of 15 feet, and furnished bark of good quality. I am led to hold the opinion that a great part of the Neilgherry and the whole of the smaller plantations of Southern India will be advantageously treated as coppice. This plan offers the further advantage of supplying abundance of excellent fuel without encroaching on the sholas.

In a report to Government now under preparation, I propose to recommend that a considerable number of trees be cut down, in order to make a full trial of the coppice system.

It seems therefore to follow that it will be advisable to await a fuller experience before the exact and permanent method of taking the bark of the plantations can be decided. It will, however, be necessary, as I had the honour of showing in a late report (appearing in Proceedings of Government, No. 235, of 22nd February 1870) to avoid the months from May to November for taking the bark.

INQUIRY II.—*Should the bark be used in the manufactory at Ootacamund for the supply of hospitals in India, or should the bark be sent to the London market for sale, or should a portion be sent home and a portion be worked on the spot?*

I am entirely of opinion that the amount of febrifuge required for use in India should be prepared in this country. The grounds for this opinion are mainly economical, and are as follow:—The cost of drying and powdering the bark is dispensed with. The alkaloids are more readily and less expensively extracted from the bark while it is fresh. The cost of conveying the bulky bark to England and the importation of the manufactured alkaloids to India is avoided. The manufacture by Government of the alkaloids permits of a great reduction in the labour and consequent cost of manufacture by allowing of the preparation of a cheaper form than that of the crystalline sulphates. The necessary materials are as readily and, with the exception of sulphuric acid, are almost as cheaply procured in this country as in England. But I consider that Government could, if it be thought fit, act most usefully in reference to the private growers of chinchona by serving as a pioneer in the European market, accustoming it to the qualities of Indian barks, and thus overcoming certain prejudices which will arise from the different appearance occasionally presented by these barks as compared with the South American. Again, the qualities possessed by the crown-barks of these plantations are such as are highly prized by the home manufacturers of quinine, so that I think a considerable quantity should eventually be sent home, in order to enhance the reputation of India-grown barks. The febrifuge preparations employed in this country can be more advantageously made from the coarser *C. Succirubra*, since the authority of Government will avoid the influence of the traditional prejudice which exists in Europe against the alkaloids other than quinine which abound in the red barks.

INQUIRY III.—*Should the plantations remain permanently in the hands of Government for the supply of quinine in the hospitals, and the distribution of seeds and plants; or should the plantations be sold, as in the case of the Government tea plantation?*

I am decidedly of opinion that as much of the plantations as hereafter will be found necessary to provide febrifuge for the supply of the hospitals and dispensaries in India should be permanently retained in the hands of Government, as I understand it forms no part of the scheme of Government to make a profit by the direct sale of bark in opposition to the private growers. But Government are very large consumers of the direct product of the plantations, and in that capacity will obtain the product at less cost than if it passes through several hands before it reaches the Medical Stores, as would be the case were Government purchasers of the febrifuge, and not proprietors. It appears to me that the ultimate end of the chinchona undertaking, namely, that of supplying the febrifuge in the cheapest possible form to the ryots, will be only effected with certainty by Government having the complete control over all stages of its production. The case of the Government tea plantation is not a parallel one, since Government are not large consumers of tea, as they are of the products of the chinchona plantations. In the former, the intention of the introduction of tea cultivation into India was the development of Indian agriculture and commerce; in the chinchona undertaking these are only accessories to the main object, which is that of obtaining a cheap and indigenous supply of the most important medicine employed in the country.

2. In order to justify the opinions I have ventured to state above, I beg to adduce a rough estimate, showing the relative cost of the febrifuge made on the spot, and that imported from Europe.

3. In carrying out the instructions I had the honour of receiving from the Home Government, I have paid much attention to the production of a febrifuge, for use in Indian hospitals and dispensaries, cheaper than the quinine sulphate. In the small manufactory at Ootacamund have been prepared, since January last, 70 lbs. of such a preparation, consisting of the mixed alkaloids precipitated in an amorphous but tolerably pure state. This has been largely used in dispensaries and hospitals, and with such success that I believe I am justified by the evidence in stating that it may nearly entirely replace the quinine sulphate hitherto employed therein. I now subjoin an estimate for the conversion of the now disused gaol at Neddivuttum into an alkaloid manufactory, and also estimate for the yearly cost of preparing 800 lbs. of amorphous alkaloids:—

	Rs.		Rs.
Six large copper boilers - - -	1,500	Stock of alcohol - - -	900
Eight large percolators - - -	1,600	Contingencies - - -	500
Setting of boilers and percolators	2,500	Still for recovering and rectify-	
Sundry alterations in building -	1,000	ing alcohol - - -	700
Sundry fittings - - -	1,500	Native mills for grinding, &c. -	40
Water supply - - -	350		
Vessels - - -	400		
Presses - - -	900		
			<u>Rs. 11,890</u>

Yearly Expenses to produce 800 lbs. of Alkaloids.

I am informed by Mr. McIvor that the cost (*on the spot*) of red bark will range from 4d. to 6d. a pound. I adopt the higher price in the estimate, and reckon its mean yield at the low one of 4 per cent.:—

	Rs.		Rs.
Bark - - - - -	5,000	Waste of alcohol - - -	300
Cost of acid - - - - -	600	Fuel - - - - -	720
„ lime - - - - -	100	Filters, bags, &c. - - -	500
„ soda from native sources	150	Contingencies - - -	800
Labour, 24 coolies: 12 at 8 rs.,			
12 at 7 rs. per month - - -	2,160		
Superintendent's pay, at 100 rs.			
per month - - - - -	1,200		<u>Rs. 11,530</u>

2. Dividing these yearly total expenses by 800, we get the cost per pound. Hence the cost of a pound of alkaloid is Rs. 14. 6. 7., or, reckoning interest at 5 per cent. on “plant,” about one rupee per ounce.

3. The cost of quinine sulphate is not accurately known in this Presidency, the purchasers for the Medical Stores being effected in England. It cannot, however, be less, when brought to this country, than 3 rupees per ounce, and probably averages considerably more.

4. It is difficult to estimate accurately the amount of quinine that would be used in this Presidency when its cost is thus reduced, but it will certainly exceed 800 lbs per annum. A larger quantity would be prepared at a still less cost. I content myself with estimating the comparative costs of entirely indigenous and imported febrifuges of equivalent therapeutic value at one rupee and three rupees respectively per ounce.

INQUIRY IV.—*If you are of opinion that the plantations should be eventually sold, at what stage of their development, that is, when do you think they ought to be sold?*

As I have stated above, I am not of opinion that the amount of plantations requisite to supply the febrifuge required in the Government dispensaries should be allowed to pass out of the hands of Government. But it is very possible that the whole of the plantations may not be required for this purpose. If this eventually be found to be the case (respecting which contingency I can offer no well-grounded opinion at present), it may be found advisable to sell a part; but this is, obviously, a matter that cannot be decided for several years to come.

Enclosure 7, in No. 1.

From the Superintendent, Government Chinchona Plantations, to the Commissioner of the Neilgherries; dated Ootacamund, 5th August 1870.

I HAVE the honour to acknowledge the receipt of your letter, dated 23rd July 1870, calling upon me for an opinion upon the various points raised by the Secretary of State in his Despatch, No. 13, dated 19th May 1870.

2. With reference to the first point, namely, what systematic course should be adopted with reference to procuring and utilising the very large quantity of alkaloid stored in the bark of the quinine-yielding chinchona, I would recommend that the trees should never be

be cut down, except when absolutely necessary for the purpose of thinning the plantations. The leaves are the means by which a continuous supply of bark can be produced. The bark of an old tree may be removed, and in one year the reproduced bark will be richer in alkaloid than that which had been the growth of years. This process may be continued year by year, and without injury to the tree. Thus a never-failing supply of bark rich in alkaloid may be secured. The process under which this result may be obtained is, that which has before been brought to the notice of Government, and is generally known as my mossing process. By this process the bark may be removed annually from the trunk of the tree, also from the larger branches, and the reproduced bark of one year's growth will be richer in alkaloid and almost equal in weight to the original bark of seven or eight years' growth. Thus, a harvest may be annually obtained nearly equal in quantity and exceeding in value what would be got were the entire plantation cut down. In the latter case another valuable crop would not be obtained under seven or eight years, being the time required for the plants to grow to size to produce bark of value. Another advantage of this system would be, that only the very best and richest bark would be sent into the market.

3. With regard to the advisability, or otherwise, of Government manufacturing quinine from bark produced on their own plantations, I feel incompetent to give a decided opinion; but my impression is, that it will cost the Government as much to produce a given quantity of quinine or any equivalent alkaloid as they could purchase it for in the market. I imagine it would be more economical for the Government to sell their bark and purchase the manufactured article. To establish the value of our plantations, and to show the success which has attended the cultivation of chinchona in India, I think not less than 3,000 lbs. of bark should be sent this year into the home markets.

4. Adverting to the question whether the plantations should remain permanently in the hands of Government or not, it appears to me that Government, having firmly established this cultivation, should dispose of their plantations, and leave the further extension to private enterprise. The distribution of seeds and plants from Government plantations is no longer necessary, as private planters who have largely entered upon this cultivation now produce plants and seeds to an unlimited extent, and in this respect are quite independent of Government aid.

5. The reasons that rendered it advisable for Government to dispose of their tea plantations after having established teas as a product of India will, I think, be found to bear with equal force in the present instance.

6. Should Government decide to dispose of their plantations, it appears to me that the time for so doing with safety would be in three or four years hence, when our youngest plants will be sufficiently established to be out of reach of all danger, and the more valuable species recently introduced would also be firmly established.

7. With reference to your concluding paragraph, I have issued strict injunctions that the instructions contained in paragraph 4 of the Secretary of State's Despatch shall be carried out.

Enclosure 8, in No. 1.

From the Superintendent of the Chinchona Plantations, Ootacamund to the Governor of Madras; dated Madras, 26th January 1871.

WITH reference to our conversation this morning, I have the honour to observe that, in my opinion, it would be desirable not to incur any further expenditure on the Upper Chinchona plantation at Mailkoondah, as this plantation is yearly injured by frost.

2. The chinchona plants in the lower plantation are making very satisfactory growth, and it appears to me that it would be desirable to maintain this plantation, and fill up the vacancies for the next two years, when the plants will be sufficiently established to make head against the natural growth of weeds and jungle.

3. The cost of maintenance need not exceed 400 rupees annually.

Enclosure 9, in No. 1.

No. 91.—ORDER of Madras Government, 7th February 1871.

THE Government proceed to dispose of the papers recorded above, which relate to the maintenance of the existing chinchona plantations, and the extent to which the manufacture of quinine is to be carried on in this Presidency.

2. In the first recorded letter Mr. Broughton proposes :—

(1.) That he be authorised to expend the savings from the sanctioned budget grant for his establishment in converting the disused gaol at Neddivuttum into a suitable place for the manufacture of “amorphous quinine.”

(2.) That a certain number of the trees planted in 1863 be cut down, in order to test the method of “coppicing” the plantations.

* G. O. (Public),
11th Jan. 1871,
No. 29.

3. The propriety of adopting the first proposition hinges on the value of “amorphous quinine,” on which point the report* of the Inspector General, Indian Medical Department, dated 21st December 1870, is so favourable that the Government have no hesitation in adopting Mr. Broughton’s proposal, and authorising him to carry it out, provided that the building in question can be spared for the purpose, on which point the Commissioner will report.

4. A provision of 7,280 rupees has been made in the Budget for 1871-72 for converting and fitting up the building, and any expenditure on the work which it may be desirable to incur in the short remaining period of the current official year can doubtless be met from savings.

5. It is satisfactory to learn that so considerable a per-centage of quinine is yielded by shoots from the stumps of trees which have been felled; and in order that the value of the quinine so obtained may be tested, as also with a view to the early introduction into the English market of the Indian-grown barks, the Superintendent of the Chinchona Plantations will be directed to fell a moderate number of trees at the proper season, the bark of which Mr. Broughton will prepare for shipment to England.

6. The Government have already decided not to incur any further expense on the *extension* of the Neilgherry chinchona plantations, and further operations in regard to chinchona will be confined to the maintenance of the existing plantations, and the introduction of such superior varieties as may from time to time be discovered both on the Neilgherries and in those districts which offer suitable sites for the purpose. They are, however, inclined to believe that the Government Quinologist has under-estimated the demand for quinine which is likely to exist when the price is considerably lowered. It must be remembered that the drug at present fetches a scarcity price, and that even in India, where its effects have been experienced, the bulk of the people are altogether unacquainted with it.

7. In accordance with the request contained in paragraph 19 of Mr. Broughton’s letter, the Commissioner will be requested to test by a careful examination of results the value of the “mossing process,” and submit his opinion to Government.

8. The Commissioner’s letter, dated 2nd September 1870, No. 42, in which are enclosed letters from Messrs. McIvor and Broughton, supplies information on the points indicated by the Secretary of State’s Despatch, dated 19th May 1870, No. 13, calling for a report on the course to be adopted with reference to the Government plantations and the manufacture of quinine. Mr. Brecks has dealt thoroughly with the question, and it is unnecessary to review in detail the subject-matter of his communication, which embraces the suggestions of Messrs. Broughton and McIvor. It will be forwarded to the Secretary of State, whose reply will influence the future position of the State in regard to the Doda-betta and Neddivuttum plantations, and the export or manufacture of quinine.

9. However the main question of the relative merits of State control and private enterprise may be hereafter decided, the Government are desirous of effecting a sensible reduction in the charges of the Neilgherry chinchona plantations. The actual expenditure of 1869-70 was 47,055 rupees, the budget-estimate for the current year was 45,400 rupees, and that sent in by the Superintendent for 1871-72 is 39,100 rupees. The Government desire to see the annual expenditure still further reduced, and, as a step in this direction, the Commissioner of the Neilgherries will be called on for a report as to the prospect of being able to effect a sale on reasonable terms of both the Mailkoondah plantation (which he has recommended should be sold), and also the plantation at Pykarra—~~which~~ ^{the} ~~Government~~ ^{Government} ~~will~~ ^{will} ~~be~~ ^{be} ~~of~~ ^{of} ~~opinion~~ ^{opinion} that a sale cannot be effected on terms which the Government ought to accept, *he will consider the expediency of abandoning the upper portion of the Mailkoondah plantation altogether, and of filling up with chinchona plants and fencing in the lower portion of that plantation and the Pykarra tract, and allowing them to develop as chinchona copses or forest, stopping all further expenditure on them, save such as may be necessary for fencing and watching them, and for collecting the bark. He will submit his opinion on these suggestions at an early date.*

10. Ordered, that the following letter be despatched to the Secretary of State :—

(Here enter Letter No. 6, dated 7th February 1871.)

See page 1.

— No. 2. —

(No. 7—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Duke,

Fort St. George, 14 February 1871.

WE have the honour to state, for the information of your Grace, that we have permitted Mr. Broughton, Government Quinologist, whose term of engagement with the Home Government, namely, three years, had expired, to continue in office, on the understanding that he is not to resign it without giving six months' notice, except in case of sickness or other urgent emergency, to be explained to our satisfaction.

We have, &c.
(signed) Napier, &c.

— No. 3. —

(No. 10—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Duke,

Fort St. George, 28 February 1871.

IN continuation of our Despatches, dated 21st March 1870 and 7th February 1871, Nos. 7 and 6, we have the honour to forward, for your Grace's information, the accompanying tabular report on the progress and condition of the chinchona plantations on the Neilgherries, for the half year ending 31st January 1871.

We have, &c.
(signed) Napier, &c.

Enclosure in No. 3.

From the Commissioner of the Neilgherries, to the Secretary to Government, Revenue Department, Madras; dated Ootacamund, 15th February 1871.

I HAVE the honour to forward the chinchona report for the half-year ending 31st January 1871.

2. Plants 13,994 have been propagated during the half-year, viz. :—

Of C. lanceolata	-	-	-	-	-	259
" calisaya	-	-	-	-	-	12,986
" pitayo	-	-	-	-	-	749
						<hr/>
						13,994

3. I see no object in propagating more calisayas if these 12,986 plants are all of one variety. I shall address Messrs. Broughton and McIvor on the subject on their return from Bengal.

REPORT on the Number, Distribution, and Condition of Chinchona Plants on the
Neilgherries, for the Half-year ending 31st January 1871.

Species.	BOTANICAL NAMES.	Commercial Names.	Number of Plants.	Value per Pound of Dry Bark in the London Market.
				s. d. s. d.
1	C. succirubra - - - -	Red bark - - - -	1,215,963	2 6 to 8 9
2	C. calisaya - - - -	Yellow bark - - - -	54,881	2 10 to 7 -
	C. calisaya frutex - - - -			
	C. calisaya vera - - - -			
	C. officinalis - - - -			
3	C. var. Condaminea - - - -	Original loxa bark - -	1,183,159	2 10 to 7 -
	C. var. Bonplandiana - - - -	Select crown bark - -	87,509	2 10 to 7 -
	C. var. Crispa - - - -	Fine crown bark - -	4,355	2 10 to 6 -
4	C. lancifolia - - - -	Pitayo bark - -	279	1 8 to 2 10
5	C. nitida - - - -	Genuine grey bark - -	2,786	1 8 to 2 9
6	C. species without name - - - -	Fine grey bark - -	8,500	1 8 to 2 10
7	C. micrantha - - - -	Grey bark - -	46,730	1 8 to 2 9
8	C. Peruviana - - - -	Finest grey bark - -	3,389	1 8 to 2 10
9	C. Pahudiana - - - -	Unknown - -	425	Unknown.
10	C. lanceolata-leaved variety of C. offi-	Seedlings - -	1,100	- ditto.
	cinalis - - - -	Rooted cuttings - -	722	- ditto.
11	C. Pitayo raised from imported seeds - - - -	- - - -	1,033	- ditto.
	C. Pitayo plants brought out by Dr. Simpson - - - -	- - - -	76	- ditto.
TOTAL Number of Plants - - - -			2,610,907	

TABLE showing the Growth of the different Species of Plants planted out in the
Plantations, for the Half-year ending 31st January 1871.

Number of Plants.	SPECIES.	Where Planted.	When Planted.	Maximum Growth.	Average Growth.	Height of the Tallest Tree.	Girth near the Ground.
				Inches.	Inches.	Ft.	Inches.
12	C. succirubra - - -	Neddiwuttum -	30 Sept. 1862	14	9½	26½	37
12	C. micrantha - - -	- ditto - - -	30 " "	15	12	25½	27½
12	C. officinalis - - -	Dodabetta - -	30 " 1863	32½	16	19	14

TABLE showing the Propagation, Distribution, &c. of Plants and Seeds during the
Half-year ending 31st January 1871.

DATE.	Total Number of Plants propagated.	Total Number per- manently planted out.	Total Number of Plants distributed to Private Individuals.	Total Quantity of Seeds distributed.
August 1870 - - - -	375	-	-	8
September " - - - -	540	-	-	5
October " - - - -	1,020	-	-	3
November " - - - -	2,335	-	-	3
December " - - - -	3,780	-	30	-
January 1871 - - - -	5,944	-	-	-
Plants received from England - - - -	13,994	-	30	19
Previously - - - -	76	-	-	-
	2,596,837	1,151,924	179,237	303
GRAND TOTAL - - - -	2,610,907	1,151,924	179,267	322

REMARKS.—The number of plants permanently planted out in the plantations is 1,151,924.

The

The increase by propagation is 13,994, the monthly average being 2,332, making the total 2,610,907.

The number of plants distributed to private individuals is 30, giving the total distribution of 179,267.

Nineteen ounces of chinchona seeds have also been gratuitously distributed, making the total 322 ounces.

Ootacamund, 9 February 1871.

— No. 4. —

(No. 11 — Public.)

From the Secretary of State for India to the Government of Madras.

My Lord, India Office, 27 April 1871.

1. I HEREWITH transmit a copy of a paper by Dr. De Vrij, the Dutch Quinologist, of a letter from Dr. De Vrij to Mr. Markham, and a circular, on the subject of the use of quinovin (or chinchona bitter) in the cure of dysentery.

2. The substance in question is one of the waste products of the chinchona plants, and it is very desirable that its alleged virtues should be investigated and reported upon by means of some such machinery as was used for testing the relative values of the different chinchona alkaloids as febrifuges. Mr. Broughton will probably be able to supply a sufficient quantity of quinovin from the waste of his amorphous quinine manufactory, to enable the medical officers of your presidency to make the investigation, and I desire that I may be furnished with their report as soon as they have had time to form a reliable opinion on the subject.

I have, &c.

(signed) *Argyll.*

Enclosure 1, in No. 4.

From Dr. J. E. De Vrij, to C. R. Markham, Esq., dated Hague, 17 April 1871.

IN reply to your letter of the 14th instant, about the use of quinovic acid, I send you, with this post, two copies of a paper on this subject published by me about seven years ago. Since that time the use of this medicine has made great progress, and it is now recognised also in Europe as an excellent cure for dysentery and diarrhoea. When I returned from India, in January 1864, the manufacturers of quinine threw it away, but at my suggestion one of them, Mr. Limmer at Frankfort-on-the-Maine, introduced it into the trade, and since that time its use has been increasing. Last year, being on a visit in England, I found that it had also been introduced there, and I join to the copies of my paper an advertisement of a wholesale chemist in London to prove the use of it in England. Although I am not at liberty to contend that the quinovic acid is even *superior* to ipecacuanha, I am quite sure that its action on the peristaltic motion is similar to it, so that, referring to the scarcity and high price of ipecacuanha, the use of quinovic acid for the cure of a disease so common in India like dysentery deserves all attention. This is the more the case, as quinovic acid can be prepared in India at almost no cost. The leaves of all the chinchonas contain that acid; those of *C. succirubra* contain in average a little more than one per cent. To prepare the acid from them, they want only to be pounded with the addition of a little slaked lime and water. This mixture is diluted with cold water, the liquid filtered, and the clear liquor precipitated by hydrochloric acid. Still cheaper would it be to use directly the filtered liquor which contains quinovate of lime. In this form every native would be able to prepare his own medicine, not only for dysentery, but also for slight attacks of fever.

Enclosure 2, in No. 4.

On the Use of Quinovic Acid (*Chinchona Bitter*) in Medicine, by Dr. J. E. De Vrij.

WHEN I found, in 1859, that all parts of the different species of chinchona growing in Java contained quinovic acid, of which I detected in the wood of the roots of *C. calisaya* so much as 2.57 per cent., it appeared to me very probable that the tonic properties of some preparations of bark, particularly of an aqueous infusion, such as the *infusum corticis peruviani cum magnesia frigide paratum*, which formerly was frequently prescribed by many Dutch physicians, might be at least partially ascribed to quinovic acid. I therefore employed the wood of several dead chinchona plants at my disposal for the preparation of this acid, which, by order of the Governor General, was, at my request, experimentally tried by the medical staff of the army. The official report on these experiments was so favourable, that the chief of the medical staff, Dr. Wassink, requested a further supply, in order to continue the experiments on a larger scale. As I had no more material at disposal with which to prepare quinovic acid, I wrote to my friend Mr. A. Delondre, at Havre-de-Grace, who was kind enough to send me not less than five kilogrammes of the crude acid from his manufactory of quinine. Although my laboratory in Java was perfectly adapted for all kinds of chemical researches, the purification of such a quantity of a substance famous for its bulky volume gave me not a little trouble, but at length I succeeded in preparing two kilogrammes of quinovic acid sufficiently pure for medical use. This quantity was used by the medical staff of the army for experiments on a larger scale in the hospitals of Java and Sumatra. The general report on these experiments, the result of which was very favourable, has been sent by the chief of the medical staff, Major General Dr. G. Wassink, to the Governor General of Dutch India, under date 5th March 1863. It appears from this report, that the quinovic acid has been used in the hospital of the west coast of Sumatra in 65 cases of intermittent fever with or without complications, and in the great majority of cases with perfect success. In the hospital at Samarang it has been used with the same success in 45 cases, and it is with great satisfaction that I quote the following passage from the report respecting the experiments at Samarang:—

“The application of quinovic acid in diarrhoea and dysentery was made in consequence of the observation of its physiological action in diminishing the secretion of the intestines, which was attributed to a diminution of the peristaltic motion. In this aspect also the results were very satisfactory, and it is therefore a new property of the quinovic acid discovered, which agrees with the tonic properties which have been ascribed to it by Dr. de Vrij.”

It appears, therefore, not only that my suggestion about the tonic properties of the quinovic acid is well-founded, but also that it is a remedy against intermittent fever. I therefore venture the suggestion to use the leaves of chinchona in British India against jungle-fever, which is in many districts a real plague. If the leaves are collected in the different chinchona plantations, which can be done without great cost, a tincture could be prepared from them with *proof spirit*, in which menstruum quinovic acid is easily dissolved, but not chlorophyll and some other inactive substances. I have much expectation that the proper use of such a tincture as a prophylactic would prevent many cases of jungle-fever in the localities where they are endemic. As the manufacturers of quinine throw away every year some hundred pounds of a substance containing quinovic acid, there is abundance of material for further experiments. I have found, besides, that the so-called *naucleic acid*, discovered by Mr. C. Bernelot Moens, military pharmacist at Batavia, in a species of *nauclea*, is identical with quinovic acid; and as, according to my investigations, all the species of *nauclea*, which are plentiful in the forests of Java, contain this acid in their bark, we have here another source whence an abundant supply could be obtained.

The Hague, 23 April 1864.

Enclosure 3, in No. 4.

QUINOVATE OF LIME.

THE tonic properties of Peruvian bark are due to quinovic acid; this has been separated from the other constituents of the bark and combined with lime, forming a definite compound, and is offered with confidence to the medical profession as a valuable substitute for the vegetable tonic bitters in general use, which, according to the report* of Dr. G. Kerner, of Frankfort, the quinovate of lime far surpasses in efficacy; the same authority states that its use in large quantities does not produce congestion of the brain, which

* Zur Pharmacodynamik der Chinارينden-Bestandtheile und ihrer Präparate. Kline Beiträge von Dr. G. Kerner, n. Frankfurt a. M.

which has been known to occur when the nitrogenous quina alkaloids have been continuously administered in full doses.

Quinovate of lime has been given with great success in cases of diarrhoea and dysentery by Drs. Neufville and Wallach in the military hospital at Frankfort, and it is recorded that in Italy its administration in the early stages of cholera was attended with very satisfactory results. Dr. De Vrij, of the Hague, speaks very highly of its efficacy in dysentery as well as in ague, having observed its favourable effects in these maladies when superintending the introduction and acclimatisation of the Peruvian bark trees in Java.

When quinovate of lime is taken internally it is readily decomposed by the acids of the stomach, and can be administered in doses of two to eight grains every hour as a powder, mixed with a little sugar of milk or phosphate of lime, or in the form of solution; the latter has been found to be the most convenient form of exhibition.

FORMULA FOR SOLUTION.

R. Calcis Quinovatis, 96 grains.
Pulv. Tragacanth, 10 grains.
Acid Phosph. Dil., q. s.
Aqua, 6 ounces.

Rub together the quinovate of lime and the powdered tragacanth with the water, add the dilute phosphoric acid drop by drop, until the quinovic acid separates in a finely divided state, which may be recognised when the mixture has a slight acid reaction on litmus-paper, and assumes a gelatinous condition.

(Dose.—From one drachm to four drachms every hour.)

— No. 5. —

(No. 15, Public, of 1871.)

From the Secretary of State for India to the Government of Madras.

My Lord, India Office, London, 29 June 1871.

I HEREWITH transmit, for distribution among officers and others connected with chinchona cultivation, 100 copies of Dr. Weddell's recent paper on the classification of the chinchona genus, which I have caused to be translated from the French and printed; and 30 copies of Mr. Cross's report* on his recent mission to collect plants and seeds in the Pitayo chinchona forests in New Grenada.

*See Part I., page 37.

I have, &c.
(signed) Argyll.

— No. 6. —

(No. 17.—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Duke, Fort St. George, 4 April 1871.

THE Government Quinologist, in reporting the receipt by him, in May 1870, of the 4½ tons of acid referred to in the Despatch of your Grace, dated 27th January preceding, No. 1, applied to us for a statement of the total outlay incurred in England on account of this acid, including its packing and freight to India. We have now the honour to request your Grace will cause us to be furnished with the information asked for by Mr. Broughton, which is necessary in order to calculate the cost to the State of the quinine manufactured in this country.

We have, &c.
(signed) Napier, &c.

CORRESPONDENCE RELATING TO

— No. 7. —

(No. 17.—Revenue.)

From the Secretary of State for India to the Government of Madras.

My Lord, India Office, London, 6 July 1871.

1. IN accordance with the request conveyed in your Despatch in this department, No. 17, dated 4th April 1871, I forward for your information a statement of the cost of certain acids sent to Madras in February 1870, for the preparation of quinine.

2. I may add that these particulars were entered in the invoice of the "Surbiton," the vessel which conveyed the acids to Beypoor. The invoice in question was sent to the Accountant General at Madras on 17th April 1870.

I have, &c.
(signed) *Argyll.*

Enclosure in No. 7.

"SURBITON" S.S., February 1870.—BEYPOOR, *via* Suez Canal.

CIVIL STORES (REVENUE), MADRAS.

Per Letter, No. 69, of 3rd December, and Indent 6th November 1869.

68	68 cases:		s. d.	£. s. d.	£. s. d.
	Acid, Sulphuric - - - lbs.	8,960	2	74 13 4	
	249 sealed bottles - - -	-	-	24 18 -	
	Acid, Hydrochloric - - - lbs.	560	2	4 13 4	
	22 sealed bottles - - -	-	-	2 4 -	
	Whiting, for packing - - - cwt.	181	2	18 2 -	
	Cases - - -	68	-	27 4 -	
	Freight paid in England - - -	-	-	-	146 14 8
					18 8 8
				£.	165 3 4
	Freight payable in India - - -	-	-	£. 36 17 6	

— No. 8. —

(No. 18.—Public.)

From the Secretary of State for India to the Government of Madras.

My Lord, India Office, 13 July 1871.

1. WITH reference to the Despatch of my predecessor, dated 9th May 1866, on the subject of the transmission of a supply of chinchona seeds, grown in India, to Mexico, I have now received an application for a second supply from the gentleman who was placed in charge of the cultivation by the late Emperor Maximilian.

2. I have to request, therefore, that you will direct Mr. McIvor to send to this office, for transmission to Mexico, parcels of well-developed ripe chinchona seeds, as soon as they are available.

I have, &c.
(signed) *Argyll.*

— No. 9. —

(No. 41—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Duke, Ootacamund, 21 September 1871.

IN continuation of our Despatch, dated 28th February 1871, No. 10, we have the honour to forward, for your Grace's information, the accompanying tabular report on the progress and condition of the chinchona plantations on the Nilgiris for the half-year ending 31st July 1871.

We have, &c.
(signed) Napier, &c.

Enclosure 1, in No. 9.

REPORT on the Number, Distribution, and Condition of Chinchona Plants on the Nilgherries, for the Half-year ending 31st July 1871.

Species.	BOTANICAL NAMES.	Commercial Names.	Number of Plants.	Value per Pound of Dry Bark in the London Market.
				s. d. s. d.
1	<i>C. succirubra</i> - - - -	Red bark - - -	1,215,963	2 6 to 8 9
2	<i>C. calisaya</i> - - - -	Yellow bark - - -	54,881	2 10 to 7 -
	<i>C. calisaya frutex</i> - - - -			
	<i>C. calisaya vera</i> - - - -			
	<i>C. officinalis</i> - - - -			
3	<i>C. var. Condaminea</i> - - - -	Original loxa bark -	1,183,159	2 10 to 7 -
	<i>C. var. Bonplandiana</i> - - - -	Select crown bark -	87,509	2 10 to 7 -
	<i>C. var. Crispa</i> - - - -	Fine crown bark -	4,855	2 10 to 6 -
4	<i>C. lancifolia</i> - - - -	Pitayo bark - - -	279	1 8 to 2 10
5	<i>C. nitida</i> - - - -	Genuine bark - - -	2,786	1 8 to 2 9
6	<i>C. species without name</i> - - - -	Fine grey bark - - -	8,500	1 8 to 2 10
7	<i>C. micrantha</i> - - - -	Grey bark - - -	46,730	1 8 to 2 9
8	<i>C. Peruviana</i> - - - -	Finest grey bark - -	3,389	1 8 to 2 10
9	<i>C. Pahudiana</i> - - - -	Unknown - - -	425	Unknown.
10	<i>C. lanceolate-leaved variety of C. officinalis</i> - - - -	- - - - -	3,387	ditto.
11	<i>C. Pitayo</i> raised from imported seeds - - - -	- - - - -	4,339	ditto.
	<i>C. Pitayo</i> plants brought out by Dr. Simpson - - - -	- - - - -	76	ditto.
TOTAL Number of Plants - - -			2,615,778	

TABLE showing the Growth of the different Species of Plants planted out in the Plantations for the Half-year ending 31st July 1871.

Number of Plants.	SPECIES.	Where Planted.	When Planted.	Maximum Growth.	Average Growth.	Height of the Tallest Tree.	Girth near the Ground.
				Inches.	Inches.	Feet.	Inches.
12	<i>C. succirubra</i> - - -	Neddivuttum -	30 Sept. 1862	37	18	27½	37
12	<i>C. micrantha</i> - - -	ditto -	30 " "	22	8	27	30
12	<i>C. officinalis</i> - - -	Dodabetta -	30 " 1863	19	10	21	16

TABLE showing the Propagation, Distribution, &c. of Plants and Seeds during the Half-year ending 31st July 1871.

D A T E.	Total Number of Plants propagated.	Total Number permanently planted out.	Total Number of Plants distributed to Private Individuals.	Total Quantity of Seeds distributed.
				Oz.
February 1871	530	-	-	4
March "	458	-	-	6
April "	623	-	-	3
May "	913	-	-	1
June "	1,092	1,250	-	4
July "	1,255	800	-	2
	4,871	2,050	-	20
Previously -	2,610,907	1,151,924	179,267	322
GRAND TOTAL	2,615,778	1,153,974	179,267	342

REMARKS.—The number of plants permanently planted out in the plantations is 2,050, making the total 1,153,974.

The increase by propagation is 4,871, the monthly average being 812, making the total 2,615,778.

No plants were distributed to private individuals during the half-year; the total therefore is the same as in last report, viz., 179,267.

Twenty ounces of chinchona seeds have been gratuitously distributed, making the total 342 ounces.

Ootacamund, 18 August 1871.

Enclosure 2, in No. 9.

From the Superintendent of the Government Chinchona Plantations, Ootacamund, to the Commissioners of the Nilgiris; dated Ootacamund, 23rd August 1871, No. 67.

IN reply to your letter of the 22nd instant, I have the honour to inform you that 2,050 chinchona plants were permanently planted out on the plantations during June and July last, viz., 1,250 of *C. calisaya* at Neddivuttum, and 800 of Pitayo at Dodabetta.

— No. 10. —

(No. 5—Forests.)

From the Government of Madras to the Secretary of State for India.

My Lord Duke, Ootacamund, 20 October 1871.

WITH reference to paragraph 4 of your Grace's Despatch, dated 28th December 1869, No. 36 (Public), we have the honour to forward, for information, the accompanying papers relative to the experimental cultivation of chinchona in the districts of Malabar, South Canara, Ganjam, Tinnevely, and Madura.

2. In Wynaad (Malabar district), the growth of the tree is reported by the Conservator of Forests to be admirable, and he suggested its extended cultivation there by the formation of a large plantation in the vicinity of Manantoddy; but we did not adopt the suggestion, as our object in propagating the growth of chinchona, namely, its introduction into as many districts as possible, has already been attained in Wynaad, where the tree is grown by planters.

3. In

3. In the South Canara district a plantation was formed, in December 1869, at Nagodi, above the Kolor Ghaut; but it will be perceived, from our proceedings of 27th July 1871, No. 1,314, that the experiment there is not likely to be productive of very useful results.

4. On the Conservator's suggestion we have, in a recent order (16th January 1871, No. 109), sanctioned the formation of a small plantation in the Ganjam district, on the Mahendra mountain. The Khond Hills in that district were represented by Major Beddome to be unsuitable for chinchona cultivation.

5. In the Tinnevely district no fresh experiments have been made in this cultivation. The proposal made by Mr. Stuart, in July 1869, for forming a plantation on the Kumeri clearing, near the Paupanassum garden, and which is adverted to in paragraph 2 of the Despatch under reply, has not been acted upon, as Major Beddome reported that the site was too much exposed. This officer proposed that a tract of virgin forest, to the west and north-west of the Paupanassum plantation, should be cleared for chinchona; but as the Tinnevely District already possesses three chinchona-gardens, we doubted (Proceedings, 14th May 1870, No. 706, paragraph 4) the expediency of forming another, especially at the expense of valuable timber.

6. Of the result of the experiment on the Pulnies (Madura district) we have as yet received no information, and have called for a report on the subject.

7. Our proceedings, marginally noted, embody a letter from a Mr. Campbell relative to his chinchona plantations on the Siroomallays, and on the Lower Pulnies, in the Madura district; also a report from the Government Quinologist on a sample of succirubra bark forwarded to him by Mr. Campbell for analysis.

17 August 1870.
1 November 1870.
14 November 1870.

I have, &c.
(signed) F. Haines, &c.

Enclosure 1, in No. 10.

PROCEEDINGS of the Madras Government, dated 12th March 1870, No. 349,
Revenue Department.

ABSTRACT.—*Chinchona Cultivation in the Hill Districts.*—Despatch from Home Government, reviewing reports on the results of various experiments for its introduction, with orders thereon.

In paragraph 2 of their Order of the 25th October, the Government, while stating that they were disposed to entertain favourably the proposal for further experiment, referred to Mr. Stuart's report as showing that the broad-leaved variety of chinchonas flourished at as low an elevation as 1,000 or 2,000 feet, and questioned the accuracy of the data on which Mr. Stuart's conclusions were based.

2. In paragraph 2 of their Order of the 12th March, Government request to be informed what has been done as to ascertaining the correct elevation. The Board have obtained from the late Sub-collector of Tinnevely barometrical readings, recorded on the Tinnevely Hills, which, after correction by the Government Astronomer, show that the elevation of the Chinna Kuluratti plantation is 2,727 feet, and that of the Kumari clearing on the Paupanassum Hills, alluded to by the Secretary of State, 2,777.

3. The plantation on the Paupanassum Hills is shown as 3,300, and that on the Peria Kuluratti Hill, where the plant failed from exposure, is 4,262.

4. The Secretary of State having now directed that the experiment should be carried on in the Kumari clearing, the Board have requested the Conservator to state what he proposes, and on receipt of his reply will again address Government on the subject. The month of July is the most favourable season for planting.

5. The Board are disposed to concur in the advisability of the experiment being further carried out by the Forest Department.

Enclosure 2, in No. 10.

From the Officiating Conservator of Forests, to the Acting Secretary to Government, Revenue Department; dated Madras, 28th March 1870, No. 2,016.

WITH reference to paragraph 2 of the Government Order, 12th March 1870, No. 349,

Elevation
in Feet.

Plantation at Perea Kulu-ratti	4,262
Plantation at Paupanassum Hills	3,800
Hill-tribe clearing on Paupanassum Hills	2,777
Plantation on Chinna Kulu-ratti	2,727

I have the honour to inform you that the elevations of the sites in question have been ascertained by the Board of Revenue, from rough notes of barometrical readings taken by the late sub-collector; these, corrected (so far as the details admitted of) by the Government Astronomer, give the heights of various places as noted in the margin.

2. With reference to paragraph 3, I must inform you that any attempt at chinchona cultivation on the Khond Hills, in the Ganjam district, would be a complete failure. These hills have only an elevation of about 2,000 feet, but there is very sharp frost in December and January, which would prove quite fatal to the *succirubra*, and burning hot winds prevail in April and May, through which no species of chinchona could live; there would be far less chance of success in these localities than on the Nullay Mullays, in the Kurnool district, where we were unable even with the greatest care and attention to keep the plant alive through the hot weather. As far as I know, the only locality in this district where the tree could be grown is the Shola, near the top of the Myhendra mountain, a little to the south of Berhampore. The elevation of this Shola is between 4,000 and 5,000 feet, there are no hot winds, and the mountain is free from frost owing to its proximity to the sea (about 12 miles as the crow flies); the area is very limited, but a small plantation might prove of considerable interest and value in a scientific point of view.

3. There can be no doubt that all the different species can be successfully cultivated on the Pulnies, and all or most of them on the Shervarôys; but it is a question how far plantations in these localities are desirable, when the cultivation can be increased to any required extent on the Neilgherries and Pulnies under Mr. McIvor's supervision at a less expense. For the present I would only recommend small experimental plantations; it would, however, be desirable at once to introduce into both these localities plants of the new variety of *Lanceifolia*, which has lately been found to yield such an immense percentage of quinine in comparison with all other species or varieties.

4. Beyond perhaps a few plants, as an experiment, I would not advise the formation of any plantations in South Canara. The crest of the ghauts is the boundary between this district and Mysore, so that plantations in South Canara would have to be opened out on the south-west face of the ghauts, and would be exposed to the full violence of the monsoon. The *succirubra* would grow very well in the Shola land over the crest of the ghauts (elevation about 3,000 feet); but, with the exception of a very small tract near Nagodi, this is all Mysore territory. There are very favourable localities about the head of the Andar Ghaut, and between that and Kig, and all along towards Naggur and the head of the Hossangady Ghaut. The Mysore Government might be recommended to open some plantations in these localities, and our Government might give assistance in plants and trained gardeners; the rainfall, soil, and other conditions of the localities alluded to are far more favourable than the site lately selected by the Mysore Government for a plantation on the Balarangams.

5. With reference to Tinnevely, the Board of Revenue have called upon me to report what steps I propose to take for carrying out the suggestion of planting the hill-tribe's clearing below the present small plantation on the Paupanassum Hills. I have been on this clearing several times, in bursts of the monsoon, when the wind was so violent that I could hardly stand; it is too much exposed, I think, for a plantation, and it is well known how very difficult it is to raise trees on these Kumari clearings, where all the virtue has been taken out of the soil by several crops of ragee, &c. A plantation in this locality would start at great disadvantages; to the west and north-west of the present chinchona garden there is a very large tract of superb land for the purpose, all clothed with heavy forest, stretching away to the Ayen Coil Pass on the north, and to the Attraymallay on the west, and with an elevation of from 3,500 to 5,000 feet. All this tract belongs to Government, the Travancore boundary being close to the Attraymallay bungalow, at an elevation somewhat over 5,000 feet. If a plantation is to be opened, a site should be selected in this tract (avoiding only a western or south-western exposure), and the virgin forest should be felled. If the plant is to be propagated from seed, a brick and glass-house will be absolutely necessary, and an overseer and several gardeners should be trained under Mr. McIvor at Ootacamund. Nothing but failure can be expected without these preliminaries.

6. I request that you will let me know to what extent Government wish chinchona-planting to be carried out in this district, and whether it is to be under the supervision of my department or that of the collector. I shall be visiting the localities in question in July or August next, and might select sites if necessary.

7. I have

7. I have, on former occasions, mentioned how admirably the *succirubra* grows in the Wynaad, at an elevation of about 3,000 feet; a few plants are to be seen on most coffee estates, and at Goodalore, and Manantoddy and elsewhere; its extended cultivation at Manantoddy or elsewhere in Wynaad and in Coorg is well worth consideration.

ORDER of Madras Government, dated 14th May 1870.

THE Officiating Conservator of Forests now replies to Government Order, dated 12th March 1870, in which he was requested to supply information on certain points connected with chinchona cultivation. The attention of the acting collector of Ganjam is called to the opinion expressed in paragraph 2 of Major Beddome's letter, that the Shola near the top of the Myhendra mountain is the only place in the Ganjam district where the chinchona is likely to flourish, and Mr. Ellis is requested to report whether it would be feasible to form a small chinchona plantation there, and, if so, by what agency.

2. With reference to paragraph 3 of Major Beddome's letter, the Government observe that the chinchona has already been acclimatised on the Shervaroys, and that Mr. J. R. Arbuthnott has been directed to obtain a supply of plants for the Pulnies from Mr. McIvor. Acclimatisation on these hills having been effected, the Government consider that the extension of chinchona cultivation may be left to private enterprise.

3. With the exception of a small tract near Nagodi, Major Beddome does not consider the climate of the ghauts in South Canara adapted for the growth of chinchona. The Government observe that Mr. H. S. Thomas, in his letter, dated 26th July 1869, No. 941, expressed a similar opinion. Mr. Thomas has already been directed to place himself in correspondence with Mr. McIvor, as a preliminary step to the introduction of chinchona into his district; and as soon as the acting collector is prepared with a suitable establishment for the maintenance of a small plantation near Nagodi, the Government will authorise Mr. McIvor to supply him with plants or seeds, unless Mr. Webster is of opinion that the plantation might with advantage be entrusted to the Forest Department.

4. Paragraphs 1, 5, and 6 of Major Beddome's report relate to the Tinnevely District, and in commenting on paragraph 3 of Government Order, dated 25th October 1869, No. 2,841, Major Beddome shows that the site selected by Mr. Stuart is too much exposed, and that the fact of its having been cleared for Kumari cultivation would operate unfavourably to the growth of chinchona. Major Beddome therefore proposes that a tract of virgin forest to the west and north-west of the existing plantation at Paupanassum should be cleared for chinchona. As the Tinnevely district already possesses three chinchona gardens, the Government doubt the expediency of forming another, especially at the expense of valuable timber.

5. Major Beddome should explain at greater length his views as to the extended cultivation of chinchona in the Wynaad

Enclosure 3, in No. 10.

PROCEEDINGS of the Board of Revenue, dated 4th June 1870.

THE Board are not disposed to agree with Major Beddome as to the unsuitability of the Khond Hills for the cultivation of chinchona. They, however, entirely concur with the Government in thinking that when the experiments in acclimatisation now being made have been completed, the extension of this cultivation should be left to private enterprise.

Enclosure 4, in No. 10.

From the Conservator of Forests, to the Acting Secretary to Government, Revenue Department, Fort St. George; dated Camp at Ootacamund, 15th June 1870.

WITH reference to paragraph 5 of the Government Order of the 14th of May 1870, I have the honour to inform you that I only wished to point out how admirably the chinchona-tree grew in Wynaad, in case its extended cultivation in this quarter might at any future time seem desirable; it is, however, probable that the area now under cultivation on the Neilgherries is sufficient. At the same time, I may draw attention to the fact that a large plantation in the vicinity of Manantoddy would be a great boon to the surrounding coffee districts in the Wynaad and Coorg, where fever is so very prevalent, and that fine sites are available both on bamboo land and heavy forest.

ORDER of Madras Government thereon, 8th August 1870.

THE Government observe that in propagating the growth of chinchona, their object (with the single exception of the plantations on the Neilgherries) is not the formation of plantations, but the introduction of the tree into as many districts as possible. This object has already been attained in the Wynaad, where the tree is grown by planters.

Enclosure 5, in No. 10.

From the Acting Collector of Ganjam, to the Acting Secretary to Government, Revenue Department, Fort St. George; dated Chetterpore, 2nd July 1870.

WITH reference to paragraph 1 of the Government Order of the 14th May last, I have the honour to report that it would be feasible to form a small chinchona plantation in the locality selected by Major Beddome, near the top of the Mahendra mountain, under the superintendence of the overseer of the Parlakimedy forests. This overseer, however, has no practical knowledge of the chinchona plantation, but, with the aid of the notes contained in the pamphlet on the propagation and cultivation of the medicinal chinchonas, he would, I think, be able to superintend the plantation. Should it be determined to form a plantation there, a large well will have to be sunk, as there is no water available close at hand, and a thick hedge made. Four gardeners will have to be employed, on a monthly salary of not less than four rupees each.

2. The zemindar of Mundasa has kindly promised me to procure the gardeners, and to take the steps for looking after the plantation, provided an experienced person be present until the operation of planting is over, and the gardeners have been instructed how to take care of the plants.

3. I doubt, however, whether in the end these detached plantations will not prove rather costly experiments; and I would respectfully suggest that the cultivation of the chinchona is more likely to be successful and remunerative when confined to the Neilgherries, and to the superintendence of those officers of Government whose skilled labour have proved how adapted its soil is to the production of this medicinal bark.

ORDER of Madras Government thereon, 18th August 1870.

THE Acting Collector is requested to state what will be the probable cost to Government of a small plantation at the spot referred to. It is important that the chinchona tree should be acclimatised in the Ganjam district.

2. Mr. Ellis will also convey to the zemindar of Mundasa the thanks of Government for his offer to maintain the plantation.

Enclosure 6, in No. 10.

From the Acting Collector of Ganjam, to the Secretary to Government, Revenue Department, Fort St. George; dated Chetterpore, 16th December 1870.

WITH reference to the Government Order of the 18th August last, I have the honour to submit an estimate showing the probable cost of maintaining a small plantation of chinchona on the Mahendra mountain, amounting in the aggregate to 200 rupees a year; the preparation, &c. of the ground will cost about 50 rupees.

2. On my asking the zemindar of Mundasa to inform me of the probable cost of reclaiming and hedging the spot selected by the overseer of the Parlakimedy forests, and of sinking a well, he informed me that the site selected by the overseer, which is situated at a distance of about a mile to the north of the bungalow erected by Mr. Forbes, and at present belonging to Mr. Carmichael, is a good one, but that there is no water close at hand; he therefore recommended the selection of another site at a distance of about half a mile to the east of the above-mentioned bungalow, a watercourse being not far off, which is not quite dry even in the hottest weather.

3. During my late tour to the southern portion of the district, I took an opportunity of visiting Mahendra; the spot recommended is in view of the bungalow, and has the advantage

vantage of a watercourse. Its extent is little over $4\frac{1}{2}$ acres, being 160 by 140 yards; that selected by the overseer is nearly $4\frac{1}{8}$, being 150 by 133 yards.

4. The presence of an experienced person is necessary, until the operation of planting is over, for the purpose of instructing the gardeners how to take care of the plants.

ESTIMATE showing the Probable Cost of forming a Chinchona Plantation on the Mahendra Mountain.

	Rupees.
Reclaiming and levelling the site - - - -	30
Hedging - ditto - - - -	10
Cost of tools, &c. - - - -	10
<i>Rs.</i>	50

Annual Charges.

	Rupees.
Pay of four gardeners, at 4 rupees each per mensem -	192
Sundries - - - - -	8
<i>Rs.</i>	200

(signed) *George Ellis*, Acting Collector.

ORDER of Madras Government thereon, 16th January 1871.

As Mr. Ellis's report shows that a small chinchona plantation can be formed in the Ganjam district, at very light cost to Government, Mr. McIvor will at once place himself in communication with the acting collector, with a view to the despatch to the district of a sufficient quantity of both plants and seeds. Mr. McIvor will select the species of plants which he deems most likely to succeed in the locality.

2. Experience in other districts has shown that the chinchona tree can, in many localities, be acclimatised by the exercise of ordinary care, and the overseer of the Purlakimedy forests will doubtless be able to establish the plantation, with the aid of such advice as he may receive from Mr. McIvor and the acting junior assistant agent.

3. The Accountant General will report how the small necessary expenditure can be provided for.

Enclosure 7, in No. 10.

From the Acting Collector of South Canara, to the Acting Secretary to the Board of Revenue; dated Mangalore, 13th June 1871.

WITH reference to the Board's proceedings, dated the 7th March last, No. 728 (Miscellaneous), I have the honour to submit the report therein called for on the experimental cultivation of chinchona in this district.

2. In the month of December 1869 my predecessor, Mr. Thomas, in accordance with the arrangement sanctioned in paragraph 2 of the proceedings of Government, dated the 20th September 1869, No. 2,610, obtained from the superintendent of the Government plantations at Ootacamund 53 plants of the *Chinchona succirubra*.

3. The plants suffered a good deal in transit. They were sent to Nagodi as soon as received, and were planted, on the 27th December 1869, on a plot of land about $1\frac{1}{4}$ acres in extent, which had been previously selected and enclosed for the purpose. A gardener was entertained on a salary of 7 rupees per month, and the potal of the village was entrusted with the general care of the plantation.

4. Owing to the damage sustained by the plants in transit, several of them never showed any signs of vigorous life; but 38 survived transplantation, and, with the exception of two, which have since died, are now in a thriving condition.

5. The height and girth of the 36 plants which are now growing are as follow :—

HEIGHT.								Number of Plants.
6 feet high	-	-	-	-	-	-	-	1
5 ditto	-	-	-	-	-	-	-	20
4 ditto	-	-	-	-	-	-	-	15
TOTAL - -								36

GIRTH.								Number of Plants.
4½ inches in girth	-	-	-	-	-	-	-	1
4 - - ditto	-	-	-	-	-	-	-	2
3½ - - ditto	-	-	-	-	-	-	-	3
3¼ - - ditto	-	-	-	-	-	-	-	10
3¼ - - ditto	-	-	-	-	-	-	-	2
3 - - ditto	-	-	-	-	-	-	-	11
2¾ - - ditto	-	-	-	-	-	-	-	5
2½ - - ditto	-	-	-	-	-	-	-	2
TOTAL - -								36

6. The head assistant collector, who occasionally visits the plantation, informs me that while the plants are in as good condition as can be desired, the leaves suffer a great deal from a large green caterpillar. The gardener goes round daily and removes the insects, but in a large plantation it would be impossible to keep the caterpillars down in this way; and I intend, therefore, to send a specimen to the superintendent of the Nilgiri plantations, and to ask his advice as to the best method of preserving the trees from their attacks.

7. Besides the plants received from Ootacamund, four were obtained from Mercara, and put down on the same place in July 1870. Of these, three have survived transplantation, and are doing well, two of them being three feet high and one two feet. The girth of one is 1½ inches, and that of the other two about two inches.

8. Some tea-plants were also put down, and are promising well. The height of Nagodi (about 2,500 feet) is, however, not sufficient for their successful cultivation.

9. The experiment has, up to the end of the last official year, cost Rs.227. 3 a. 5 p. in wages of the gardener, and other sundry charges, the whole expenditure being defrayed from the Jungle Conservancy Fund.

SUBMITTED to the Government with reference to paragraph 3 of Government Order, 14th May 1870, No. 706, Revenue Department.

2. As an experiment, the plantation at Nagodi seems to have done well; but the Board remark that Major Beddome, in his letter, recorded in the Government Order above quoted, advised that plantations should not be formed in South Canara, except as a mere experiment with a few plants.

ORDER of Madras Government thereon, 27th July 1871.

THE experiment does not seem likely to be productive of very useful results. The collector will consider whether it is worth while to continue the employment of the gardener. The chinchonas could be entrusted to the potail, with the promise of an annual gratuity if they were well cared for. They are now nearly large enough to take care of themselves. Private individuals might also receive seed and plants in time.

Enclosure 8, in No. 10.

EXTRACT from Proceedings of the Madras Government, Revenue Department,
11th October 1871.

IN Government Order, 14th May 1870, the Government, in passing orders on a letter from the Conservator of Forests respecting chinchona cultivation in certain districts of this Presidency, remarked in paragraph 2 that "Mr. J. R. Arbuthnott has been directed "to obtain a supply of plants for the Pulnies from Mr. McIvor." No information has yet reached the Government of the result of this experiment, and they desire that the Conservator will place himself in communication with the Collector, and submit an early report on the subject for transmission to the Secretary of State.

Enclosure 9, in No. 10.

From *E. A. Campbell*, Esq., Madura, to the Acting Secretary to the Board of Revenue;
dated Dindigul, 18th June 1870.

I SEND you to-day, for analysis by the Government Quinologist (should the Board deem the analysis worth making), the stem of a chinchona-plant (broad leaf), raised on the Siroomullay Hills, Madura District.

2. The tree was two years old, and stood 6½ feet high. I have an acre of chinchonas of the same age on the Siroomullays, and an acre on the Lower Pulneys.

3. As fever prevails on these ranges, I shall be much pleased to hear that the plant now sent yields a fair sample of quinine.

4. I should note that though the other trees are remarkably vigorous, and that the plant thrives well on both ranges of hills, the particular plant now sent was drooping when cut; something seemed to have injured its roots.

5. Should the Quinologist deem that the secretions of the bark have been injured from the above cause, I will send samples of vigorous and healthy trees.

6. I have grown the dhinchonas in "the open," merely planting them in pits 20 by 10, and leaving them to take their chance. Drought does not seem to have affected them in the least, though a few, which were watered for experiment, have attained a greater height and circumference than those not watered at all. Again, some watered to excess have failed entirely.

ORDER of Board of Revenue thereon, forwarded to the Government Quinologist, who is requested to favour the Board with his opinion of the bark.

2. The Collector of Madura will be requested to thank Mr. Campbell for his communication, and to ascertain from him, as nearly as may be, the respective heights of his two plantations.

3. A copy of these proceedings will be submitted to Government, with reference to Major Beddome's letter, No. 2,916, of the 28th March last. It will be observed that no forest appears to have been felled for Mr. Campbell's plantations.

Enclosure 10, in No. 10.

From the Collector of Madura to the Acting Secretary to the Board of Revenue, dated
19 September 1870.

ADVERTING to paragraph 2 of the Proceedings of the Board, dated 9th July 1870, I have the honour to state that the height of Mr. Campbell's chinchona garden at Periyar is 3,600 feet, and that on the Sirumalais 3,500 feet.

2. With reference to the remark of the Board in the latter part of paragraph 3, Mr. Campbell states that the former plantation was made on cultivated land, and the latter on forest.

Enclosure 11, in No. 10.

From the Government Quinologist, to the Acting Sub-Secretary to the Board of Revenue ;
dated Ootacamund, October 1870.

REFERRING to Proceedings of Board of 10th August 1870, I have the honour to report on a sample of *Chinchona Succirubra* bark received from the Collector of Madura.

2. The bark received was of a very immature description, and appeared mere scrapings of the bark of branches, or else of very young trees. Such bark would, in the English market, be worthless from its unpromising appearance. Its analysis gave, in 100 parts of dry bark—

Total alkaloids	-	-	-	-	-	-	2.53 per cent.
Quinine	-	-	-	-	-	-	0.76 „
Chinchonidine and chinchonine	-	-	-	-	-	-	1.77 „

3. These alkaloids yielded a fair amount of crystalline sulphates.

4. According to the high standard of Indian chinchona barks, I cannot consider the above a good result. In the case of the bark being (as it certainly appears) that of either trees two years old, or else of branches, the above analysis is tolerably encouraging, and equal to that of barks of same age grown in Wynaad or on the Shervaroys. A more careful collection will, however, be necessary, if it be proposed, at any subsequent time, sending it to the European market.

From the Government Quinologist, to the Acting Sub-Secretary to the Board of Revenue ;
dated Ootacamund, 22nd July 1870.

I HAVE had the honour to receive a parcel of chinchona bark, together with a copy of Proceedings of the Board of Revenue, No. 4,785, dated 9th July 1870.

2. The bark sent is of very inferior quality, and is apparently the product of an unhealthy tree. There will obviously be no interest in making an analysis of other than a normal specimen of the chinchona-bark of the Siroomullays. I therefore request that I may be supplied with one-third pound of the trunk-bark from at least three healthy trees. This might be collected and sent to me at once in the undried state, when I shall have much pleasure in making an analysis.

PROCEEDINGS of Board of Revenue, 10th August 1870.

COMMUNICATED to the Collector of Madura, in continuation of Board's Proceedings, dated 9th July 1870.

2. Mr. Arbuthnott is requested to ask Mr. Campbell to be so good as to send the bark required by Mr. Broughton, to enable him to make a satisfactory analysis.

— No. 11. —

(No. 12—Revenue Forests.)

From the Secretary of State for India to the Government of Madras.

My Lord,

India Office, London, 20 December 1871.

1. I HAVE received and considered in Council your Excellency's Despatch, dated 20th October (No. 5) 1871, forwarding papers relating to the cultivation of chinchona plants in the various hill districts of your Presidency.

2. I observe with satisfaction that gardens have been successfully established on the Sherwaroy Hills and in Tinnevely, while Mr. Campbell is taking pains to secure satisfactory results on the Lower Pulney and Siroomullay Hills, and is persevering with a steadiness of purpose which deserves to be rewarded by success. The healthy growth of the plants in the open grass-land called *patena* in Ceylon, seems to be an important feature in Mr. Campbell's experiment.

3. The district of Wynaad, owing to the very large annual influx of labourers from Mysore, and the prevalence of fever among them, is not in quite the same category as the frequented hill regions. I am of opinion that the circumstances of Wynaad give that district a special claim to assistance from your Government in establishing an adequate extent of chinchona cultivation. It is for your Government to decide whether this object may best be secured by forming a plantation in accordance with the advice of Major Beddome, or by encouraging the planters to cultivate chinchona on their own land. But the measure is one which should be supported by the influence of your Government, and, as I observed in my Despatch, dated 29th July 1869, all reasonable assistance should be extended to the Assistant Collector, or to private persons, who may be induced to exert themselves in furthering and extending the cultivation. I look upon the extensive cultivation of the febrifuge plants in Wynaad as a measure of great importance, not only to the inhabitants of the district, but also to the numerous class of labourers who annually resort to it from a distance, and I desire that I may be regularly informed of the progress of the cultivation, and of the actual localities where it has been undertaken.

I have, &c.
(signed) *Argyll.*

— No. 12. —

(No. 49—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Duke,

Fort St. George, 14 November 1871.

WITH reference to your Grace's despatch, dated 13th July 1871, No. 18, we have the honour to report that a case containing chinchona-seeds* from the Government plantation at Neddivuttum, Nilgiris, has been forwarded by steamer to the India Office for transmission to Mexico. Mr. McIvor's letter forwarding the seeds is enclosed.

We have, &c.
(signed) *Napier, &c.*

* Two packets of *Chinchona succirubra*, one packet of *Chinchona officinalis*, and one packet of *Chinchona Condaminea*. Proceedings of Government, 13th November 1871, Nos. 82, 83.

Enclosure in No. 12.

From the Superintendent, Government Chinchona Plantations, to the Commissioner of the Nilgiris; dated Ootacamund, 24th October 1871.

WITH reference to the despatch of the Secretary of State for India of the 13th July last, No. 18, and the Order of Government of the 22nd August 1871, No. 1449, I have the honour to enclose four ounces of fresh-gathered seeds of *Chinchona Succirubra* and four ounces of *Chinchona officinalis* seeds. The other species will be forwarded for transmission to Mexico so soon as ripe seeds can be gathered.

— No. 13. —

(No. 36—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Duke,

Ootacamund, 21 August 1871.

WITH reference to the despatches marginally noted,* we have the honour to advise your Grace of the transmission to the India Office, by steamer, *via* the Suez Canal, of twenty-one cases, received from the Commissioner of the Nilgiris, containing in all 3,188½ lbs. of chinchona-bark for sale in the English market.

*To Secretary of State, 7th February 1871, No. 6, paragraph 8, Miscellaneous.
From Secretary of State, 4th April 1871, No. 7, paragraph 6, Public.

2. The Commissioner's letter on the subject, with its enclosures, and another from the Government Quinologist, reporting the results of the analyses of the barks in question, are herewith forwarded.

We have, &c.
(signed) Napier, &c.

Enclosure 1, in No. 13.

From the Commissioner of the Nilgiris, to the Secretary to Government, Revenue Department, Fort Saint George; dated Ootacamund, 2nd August 1871.

WITH reference to the Order of Government, dated 5th December 1870, Revenue Department, and to enclosed letter from Mr. McIvor, I have the honour to request that you will be so good as to inform me to whom the chinchona-bark proposed to be shipped to England should be consigned, and through whom forwarded.

From the Superintendent, Government Chinchona Plantations, to the Commissioner of the Nilgiris; dated Ootacamund, 29th July 1871.

WITH reference to the Order of Government, No. 1941, under date 5th December 1870, I have the honour to inform you that I have packed 3,188½ lbs. of dry chinchona bark for despatch to England, and shall feel obliged by your being so good as to inform me to whom it should be consigned, and how it should be forwarded.

ORDER of Madras Government thereon, 4th August 1871.

THE packages should be forwarded to the Government Office, Madras, for immediate despatch to the Secretary of State, *viâ* the Suez Canal.

Enclosure 2, in No. 13.

From the Government Quinologist, to the Secretary to Government, Reveue Department, Fort Saint George; dated Ootacamund, 3rd August 1871.

THE cases of Chinchona Bark now packed, in order to send to England, are as follows:—

		lbs.			lbs.
1	Box old mossed Succirubra	135	13	Box small mossed Succirubra	90
2	" " "	135	14	" old mossed " 14½	137½
3	" " "	135		unmossed " 123	
4	" " "	145	15	" " "	145½
5	" " "	155	16	" " "	142
6	" " "	161	17	" mossed Condaminea (officialis).	108
7	" " "	150	18	" " "	182½
8	" small mossed "	141	19	" " "	179
9	" " "	143½	20	" " "	173½
10	" " "	200	21	" unmossed "	180
11	" " "	164			
12	" " "	186			3,188½

The above have been analysed, for the purpose of ascertaining, as nearly as possible, their mean yield in per-centages of dry bark:—

	Old mossed Succirubra.	Small mossed Succirubra.	Unmossed Succirubra.	Unmossed Officialis.
Total alkaloids	7.61	6.56	5.43	4.96
Quinine	1.17	1.74	2.09	3.03
Chinchonidine and chinchonine	6.44	4.82	3.34	1.93
Sulphate quinine, obtained crystallised	0.71	1.25	0.95	3.14
Sulphate chinchonidine, crystallised	4.66	2.63	2.18	1.05
Total crystalline sulphates, excluding chinchonine	5.37	3.88	3.13	4.19

The mossed crown-bark is of two ages, which have been unfortunately mixed in cases; their analyses yielded :—

	Oldest trees.	Second age.
Total alkaloids - - - - -	7.41	4.73
Quinine - - - - -	4.57	2.96
Chinchonidine and chinchonine - -	2.84	1.77
Sulphate quinine, obtained crystallised -	4.46	2.55
Sulphate chinchonidine, crystallised -	1.74	0.94
Total sulphates, excluding chinchonine -	6.20	3.49

As at the present time the prices of chinchona bark in English market are high, I should strongly recommend that the bark be sent *via* Suez Canal, in order to avoid delay. The Government will, of course, do as is considered best about making the analyses of the barks known before sale. But of the red barks I should certainly recommend that only the amounts of "Total alkaloids" and "Total sulphates, excluding chinchonine," be made known.

— No. 14. —

(No. 3—Revenue.)

From the Secretary of State for India to the Government of Madras.

My Lord,

India Office, London, 11 January 1872.

1. WITH reference to your Excellency's Despatch, dated 21st August (No. 36) 1871, reporting the transmission, by the Suez Canal, of 3,188½ lbs. of chinchona bark for sale in the London market, I have now to inform you that the bark was sold in the ordinary way, with other lots from South America, on the 22nd of last December, without any reserve price.

2. The prices obtained at the sale are satisfactory, ranging from 2s. 1d. to 2s. 10d. the lb. The highest prices were fetched by the unmossed *Succirubra* and the unmossed *Condaminea* barks, which reached to 2s. 9d. and 2s. 10d. the pound. The old mossed *Succirubra* only sold for 2s. 3d. the pound.

I have, &c.
(signed) *Argyll.*

— No. 15. —

(No. 9—Revenue.)

From the Secretary of State for India to the Government of Madras.

My Lord,

India Office, London, 25 January 1872.

WITH reference to my despatch dated 11th instant, (No. 3), announcing the result of the sale of chinchona bark from the Neilgherry plantations, I now have to inform you that the gross sum realised was 353 l. 10s. 8d., and that the net sum paid by the broker was 333 l. 8s. 6d., which has been placed to the credit of Revenue, in the Home Account.

I have, &c.
(signed) *Argyll.*

— No. 16. —

(No. 45—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Duke,

Ootacamund, 7 November 1871.

WE have the honour to forward, for the information of your Grace, the accompanying report from the Government Quinologist on the chinchona barks of the Government plantations, together with our proceedings thereon, dated 26th September 1871, No. 1686.

2. Our proceedings of 22nd September 1868 and 22nd February 1870, referred to in Mr. Broughton's report (paragraphs 2, 4, and 11), were forwarded to the Home Government, with our despatches dated respectively 6th October 1868, No. 49, and 21st March 1870, No. 8.

We have, &c.
(signed) Napier, &c.

Enclosure in No. 16.

From the Government Quinologist to the Secretary to Government, Revenue Department, Fort St. George; dated Ootacamund, 31st July 1871.

As in certain former reports, I have the honour to adduce analyses, which express the changes in the composition of our oldest barks during the past two years. The following table expresses the amount of alkaloids in the trunk bark of the eldest trees of *C. Succirubra* in the month of May, the period of maximum yield in the respective years. The amount is expressed in per-centages of dry bark:—

	1868.	1869.	1870.	1871.
Total alkaloids - - - - -	6·74	7·43	7·60	7·85
Total sulphates obtained - - - - -	6·0	6·43	6·00	5·45
Quinine - - - - -	2·40	1·72	1·73	1·80
Chinchonidine and chinchonine - - - - -	4·34	5·71	5·87	6·05
Sulphate of quinine, obtained crystallised - -	2·21	1·51	1·40	1·15
Sulphate of chinchonidine, obtained crystallised -	3·85	4·92	4·60	4·30

2. The above analyses show that up to May 1871 the total amount of alkaloids in the red bark had continued to increase. But, as I had the honour to mention in a report, dated 17th August 1868 (Proceedings Madras Government, 22nd September 1868, No. 334, Revenue Department), as being highly probable to occur, the annual increments diminish in amount, a circumstance which indicates that the bark is arriving at its maximum of yield. The numbers which approximately express the annual increments during the period of my observations are 0·75, 0·69, 0·17, 0·25. The circumstance that these numbers do not accurately express a regular diminution of increment is doubtless attributable to the difficulty which occurs in collecting in successive years a sample which shall accurately represent the mean yield of the bark of a large number of trees, together with the difficulty in collecting the samples each year under precisely comparable circumstances.

3. From certain results obtained in the comparison of the analyses of barks that have been treated with moss, with those of the natural unmossed bark, I am strongly inclined to believe that if the bark of our oldest trees has not actually reached the age of its greatest yield, it must have very nearly approached it. As this is a point of some importance, which cannot be held decided without positive proof hereafter be obtained, I here merely mention my personal opinion.

4. In a report appearing (Proceedings Madras Government, 22nd February 1870, No. 235, paragraph 4), I had occasion to mention that the amount of quinine had diminished during past years in the red barks, although that of the total alkaloids had increased.

During the last two years it appears that the amount of quinine has remained nearly constant, and probably, in years to come, its amount will hereafter remain nearly stationary in our red bark.

5. From the above analyses it also seems probable that the amount of obtainable crystallised sulphate of chinchonidine is diminishing with the increase of age. But with the present evidence I cannot hold this yet to be quite clear, since the determination of the amount of crystallised sulphates is apt to be modified by circumstances other than the real amount of pure alkaloid, which latter it only approximately indicates.

6. The large amount of variation, according to circumstance of growth, met with in the bark of *C. officinalis* renders a precise determination of its mean quality a work of great difficulty. I here quote certain analyses of this bark calculated in per-centages of its dry state:—

CROWN BARK from DODABETTA PLANTATION.

	I. Trees of good growth, Six Years Six Months of Age.	II. Trees of good growth, Five Years Nine Months of Age.	III. Oldest Trees.	IV. Trees of fine growth.
Total alkaloids - - - - -	5.26	3.10	6.53	6.91
Quinine - - - - -	3.48	1.62	4.18	4.71
Chinchonidine and chinchonine - -	1.78	1.50	2.35	2.20
Sulphate of quinine, obtained crystallised	3.25	1.64	4.17	4.80
Sulphate of chinchonidine, obtained crystallised.	2.04	1.14	1.57	1.60

CROWN BARK from NEDDIVUTTUM PLANTATION.

	Trees, Six Years Nine Months of Age.	Trees, Six Years Three Months of Age, of good growth.
Total alkaloids - - - - -	4.96	6.01
Quinine - - - - -	3.03	4.19
Chinchonidine and chinchonine - -	1.93	1.32
Sulphate of quinine, obtained crystallised	3.14	4.24
Sulphate of chinchonidine, obtained crystallised.	1.05	1.39

7. The above analyses, though comparatively useless to determine the alteration of the bark with age, are adduced as showing the high quality of the barks. Though it falls without my province to speak of the improvement in the growth of the *C. officinalis* trees, yet I cannot forbear to remark that a low yield is getting much less frequent in their bark than formerly. Both the crown barks of Dodabet plantation, which consists entirely of this species, and those of Neddivuttum are improving in quality. The increase in the yield of alkaloids is quite apparent, although I cannot with accuracy express its actual amount. This increase is due to quinine; and at present it actually appears probable that hereafter the total yield of alkaloids will equal that of the red bark. These two kinds divide between them nearly the whole of our plantations. For European quinine manufacture the bark of *C. officinalis* is admirably suited, as it is so rich in quinine. In addition, it is easy to work, and the sulphate of quinine crystallises with great readiness and purity. It is especially the bark for export to Europe. A small quantity is now packed for sending to England, and I trust that from time to time its export may be continued.

8. In total yield the bark of *C. Succirubra* is the richest, but in its natural state, at least, this consists mainly of chinchonidine, chinchonine, and, occasionally, quinidine, alkaloids which custom and the addition of fresh names, coincident with the first separation of these substances, have kept out of extensive therapeutical use. The medical reports of the Chinchona Commissioners of the Indian Presidencies and the report on the medical use of "amorphous quinine" appear to indicate that these alkaloids, and consequently red bark, is the kind that can be employed most usefully in India. In Europe

Europe the price of the natural red bark will hereafter sink, when it is brought into competition with crown bark. How far by careful special cultivation of the red bark it may hereafter be possible to modify this result it would at present be premature to speculate.

9. After the above kinds, the most important at present cultivated on the plantations is undoubtedly that of *C. Calisaya*. As in my former reports the trees of *Calisaya* were very young, it is quite natural to find the amount of alkaloids in the bark has increased. The most remarkable point about the plants of *C. Calisaya* is the great number of varieties. These display almost every habit. As it was necessary to examine the bark of the trees of most marked character, in order to determine the kind most suitable for cultivation, these varieties have taken up much time. I have the honour to quote the analyses of several of these varieties. The alkaloids are given in per-centages contained in dry bark:—

TRUNK BARK of *C. Calisaya*, grown at Neddivuttum.

	I.	II.	III.	IV.	V.
Total alkaloids - - - -	3.95	3.93	5.28	4.16	5.36
Quinine - - - - -	2.67	3.18	1.02	2.50	4.67
Chinchonidine and chinchonine -	1.28	0.75	4.26	1.66	0.69

10. These represent fairly the different yields I have met with among the kinds of *C. Calisaya* raised from seed obtained from Mr. Money. They are, as a whole, of good quality; but No. V., or the bark of a variety with broad leaves, which are red in the under-surface and of vigorous habit, is the kind which should be propagated, as it is the one whose cultivation can be most profitably extended. I have examined the bark of several other varieties besides those whose analyses are given above, but find them all inferior to No. V., and promising nothing remarkable in their qualities. The bark of our *C. Calisaya* is of excellent quality, and is better suited for quinine manufacturers' use than that of *C. Succirubra*. I regret that a larger number of the trees has not been planted; but as the yield of bark from the present plantations will shortly be so large, I cannot now recommend any considerable extension, even with this sort.

11. In a report appearing in Proceedings Madras Government, Revenue Department, No. 334, paragraphs 22 and 23, I had occasion to remark that in the barks of *C. Succirubra* and *Officinalis* a high mean temperature appeared unfavourable to the production of quinine; that alkaloid occurring more readily in the bark of trees grown at high elevations within certain limits. I have met with a remarkable illustration of this principle also in the bark of *C. Peruviana*. The bark of this tree grown at Neddivuttum generally contains no quinine whatever, and at best contains it in so small an amount that it is with difficulty it can be clearly detected. But the superintendent of the plantations has with great judgment experimentally planted several of these trees at Dodabet plantation, where they grow with much difficulty from the cold being too great for them. An analysis of the bark of one of these trees gave the following results, to which, for comparison, I attach an analysis of the bark grown at Neddivuttum:—

Dodabetta.		Neddivuttum.	
Total alkaloids - - - -	2.06	Total alkaloids - - - -	6.25
Quinine - - - - -	0.70	Soluble in ether - - - -	0.41
Chinchonidine and chinchonine -	1.27	Chinchonidine - - - -	2.00
Sulphate quinine, obtained crystallised - - - -	0.67	Chinchonine - - - -	3.84
Sulphate chinchonidine, obtained crystallised - - - -	0.94	Sulphate chinchonidine, obtained crystallised - - - -	1.80

Though the bark of *C. Peruviana* from Neddivuttum contained a small amount of alkaloid soluble in ether, it was not quinine. But by growing the same species at the higher elevation of Dodabet plantation, its bark quite alters its character, and yields in analysis an amount of pure quinine which readily crystallises as sulphate. Indeed, the bark thus grown far more resembles the bark of *C. Succirubra* than a grey bark. I cannot but consider this instance of a total change of alkaloid by increase of elevation a most interesting one.

12. The occurrence of several remarkable varieties among the trees raised from seed has directed my attention to the occurrence of hybrids among our species of chinchona. In one instance I was able, from the account given by Mr. C. Dawson, then assistant superintendent at Neddivuttum, to directly trace the origin of a very beautiful plant, which was found to be a hybrid between *C. Succirubra* and *Micrantha*. This plant was picked up a seedling under a tree of the latter. I analysed its bark, and found its yield was poor, but represented a mean between the qualities of the two species. Examination among seedling trees led to the discovery of many other examples of hybridism, especially to cross-breeds between *C. Succirubra* and *Officinalis*. In 1870 I communicated a short memoir on the subject to the Linnæan Society.* The occurrence of the dimorphic varieties, "*macho*" and "*hembra*," in each species of chinchona was shown in this communication to render cross-breeding highly probable, in the same manner as has been shown by Darwin to occur in *Primula*, *Oxalis*, and other plants. I learn, from the discussion which took place on the subject at the Society's meeting, that the fact of the tendency of chinchona to hybridism was considered proved. Since that time I have made numerous analyses of the bark of various hybrids that I have observed, but in no one instance have I found any of special excellence. In fact, it appears to me that these hybrids combine the bad qualities of both their parents. I therefore do not quote the analyses.

* Read 3rd March
1870.

13. I cannot but think that this ready hybridism between the species of chinchona affords an explanation of the occurrence of the numerous *varieties* which have been recognised by botanists. I observe, for instance, that a most recent classification gives 33 undoubted species and nearly 80 separate varieties of chinchona. On our plantations there are several plants which, though certainly hybrids, would undoubtedly be made into species by a botanist ignorant of their origin. It seems therefore not improbable that several species to which a separate name has been attributed may be only South American hybrids. It is to be hoped that in any future botanical classification of the genus this circumstance may be borne in mind.

14. This fact of the inter-breeding of the species renders the seed of a tree, surrounded with many others of a different kind, subject to considerable uncertainty of producing all plants like its parent. As a fact, the seeds of the variety I called, provisionally, "*lanceolata*" gave but few plants which resembled their parent, and consequently the seedlings had to be discarded. As the tree producing the seeds was surrounded on all sides by the ordinary crown barks, the variation in the seedlings becomes intelligible.

15. I observe that Dr. Weddell, in his "Notes sur les quinquinas" (*Annales des Sciences naturelles*, 5 e serie, tomes XI. and XII.), and at the suggestion of Mr. Howard, calls the valuable variety I called "*lanceolata*," above alluded to, "*Cinchona officinalis*, *Bonplandiana*, *Angustifolia*," remarking that *lanceolata* does not express so well as *angustifolia* the peculiar-shaped leaf. I would suggest that the name *angustifolia* be in future adopted as the name of the variety.

16. In several preceding reports I have abundantly stated my convictions, and their grounds, for considering that living chinchona-bark has its yield of alkaloids injured by exposure to sunlight. The experimental evidence of this already adduced appears to me to be quite conclusive of the fact, so that further proof is scarcely needed. Further proof appears, however, in the circumstance, of which I have been for some time aware, that the bark of opposite sides of the same tree differs in yield of alkaloids. This, of course, is only fully apparent in trees that are equally exposed to sunlight on each side, which, from the site of the plantations, does not generally occur. But the following analyses express the yields of the bark taken respectively from the north and south sides of a tree which is equally exposed on all sides. The bark was taken 25th July 1871:—

	North Side.	South Side.
Total alkaloids - - - - -	3.18	3.80
Quinine - - - - -	0.62	1.40
Chinchonidine and chinchonine - - - - -	2.56	2.40

17. As the sun has been on the north side of the tree for the last four months, the effect has been that the yield of alkaloids has been diminished 0·68 per cent. This decrease apparently consists of quinine, which is commercially the most valuable of the alkaloids. This effect has been produced in spite of its being the most cloudy period of the year.

ORDER of Madras Government thereon, 26th September 1871.

ORDERED, that the above paper be forwarded for the information of the Right Honourable the Secretary of State, and that copies be as usual furnished to the Governments of India and of the other Presidencies, and of Ceylon, the Straits Settlements, Batavia, and the French Settlements in India.

2. The facts noted by Mr. Broughton are of much interest, especially as regards the effect of altitude and sunlight on the production of quinine. The attention of Mr. McIvor, the superintendent of chinchona plantations, will be specially directed to the apparent ready hybridisation noticed by Mr. Broughton, in view to steps being taken to isolate plants of the more valuable kinds for the production of pure seed.

— No. 17. —

(No. 4.—Revenue.)

From the Secretary of State for India to the Government of Madras.

My Lord,

India Office, London, 11 January 1872.

1. MR. BROUGHTON's Report on the examination of chinchona-barks, dated 31st July 1871, has been received, with your Excellency's Despatch, dated 7th November (No. 45) 1871, and has been under my consideration in Council.

2. Its perusal has impressed me with a sense of the value of these periodical reports by a competent quinologist. They indicate the measures which should be adopted in conducting the cultivation, and furnish your Government with accurate data respecting the tendency of the course hitherto pursued at the earliest possible moment. Thus not only is much time saved, but errors are avoided, and in the end considerable saving in actual outlay is doubtless effected.

3. The conclusion to which the present Report seems to point is, that it will be found advisable to use one set of barks for general consumption among the natives in India, and to cultivate another, having a larger yield of crystallisable sulphate of quinine for sale in the London market. The establishment of the interesting fact that hybridism readily takes place between the chinchona species is also important, and points to the necessity for keeping the species apart, in order to secure good seeds.

4. I take this opportunity of repeating the request that a complete set of the flowering and fruit-bearing branches and of the barks of each of the chinchona species now growing on the Neilgherries may be transmitted to this office.

I have, &c.

(signed) *Argyll.*

— No. 18. —

(No. 10 —Revenue.)

From the Secretary of State for India to the Government of Madras.

My Lord,

India Office, London, 8 February 1872.

WITH reference to my previous Despatch, dated 11th January (No. 4) 1872, I transmit herewith 30 copies of some notes prepared at my request by Mr. Howard, the quinine manufacturer, after perusing Mr. Broughton's Report, dated 31st July 1871. You will perceive that Mr. Howard attaches great importance to the extension of the cultivation of the *Angustifolia* variety of crown-bark. It appears that the importation of the once famous crown-barks from South America has practically ceased, so that the world is now dependent on India for the supply of this valuable product. Mr. Howard is also of opinion that the grey barks should not be neglected, as the demand for chinchonine, which they yield so abundantly, is increasing. I desire that Mr. Broughton and Mr. M'Ivor may be furnished with copies of Mr. Howard's Report, and that they may be instructed to give their careful attention to the remarks and suggestions of this eminent quinologist.

I have, &c.
(signed) Argyll.

Enclosure in No. 18.

Sir,

Tottenham, 16 January 1872.

In compliance with a request from the Secretary of State for India, dated the 6th instant, I beg to transmit the following remarks, which I have the more pleasure in doing, as I can now report more favourably of the results of the cultivation than at any previous period of the undertaking.

In reference to "the species which is likely to produce the most remunerative bark for sale in the London market," I will remark, in the first place, on that which has been the most largely cultivated, the red bark tree, or *Chinchona succirubra*.

Two circumstances especially recommended this sort for cultivation: its free propagation and growth, and the very high price paid for the mature bark of this sort in the London market.

I have never been favourable to the almost exclusive preference paid to this sort by many cultivators. I have shown,* in a recent examination of two trees sent me by the Indian Government, one of this sort and the other of *C. officinalis*, that the more rapid development of the former species did not secure a comparative advantage as to the production of alkaloid, since the quinine in the latter rind exists in a more abundant quantity as to the percentage in the bark, and also in a much purer state than in the former (the *C. succirubra*).

I am happy to be able, in this view of the subject, to coincide entirely with the published report of Mr. Broughton, whose more extended opportunities of observation supplement the more limited character of my own personal investigation. In reference to the price of the bark, I remarked, in my report dated 15th June 1864, that "the very high price of between 8s. and 9s., which has been recently paid for red bark in this market, applies only to those pieces of bark from the trunk which possess from their age a peculiarly bright appearance.

A further recommendation of the *C. succirubra* to notice exists in the fact that it gives, on the whole, a very large product of alkaloid, and also of the chinchona red, so that it may be called the most *chinchonaceous* of all the chinchonæ. Against this must be set the fact that, in connection with the gradual oxidation of the chincho-tannic acid and the production of the chinchona-red, there is a gradual diminution and waste of the alkaloids, so that the bark does not really improve by age, but the contrary. This is the peculiar habit of the species, and it would seem, from the accompanying report of Mr. Broughton, that the effect of this idiosyncrasy is already beginning to be apparent.†

It will be noticed that, whilst the *total alkaloids* have risen from 6·74 per cent. in 1868 to 7·85 in 1871, the "sulphate of quinine obtained crystallised," which, to a large extent, marks the value of the bark in the eyes of the quinine manufacturer, has steadily declined from 2·21 per cent. in 1868 to 1·15 per cent. in 1871. The sulphate of chinchonidine obtained crystallised has, in the meantime, risen from 3·85 per cent. in 1868 to 4·30 per cent. in 1871. It will immediately occur that this is, to a certain extent, a counterpoise, as no doubt it is, but to a certain extent only, as will be explained hereafter.

It is needful also to remark that the *waste* of alkaloid, which has been apparent to the writer in the examination of many specimens of South American bark of the age of perhaps one or two centuries, has not yet taken place in these still young Indian specimens, and also that it is open to question whether the apparent conversion of chinchonidine into

quinine

* "Pharm. Journal," November 1871.

† i.e., in the *present change*, to be followed by *future waste* in the alkaloids.

quinine is due to deoxidation,* which increases also the proportion of chinchonine, or to some other cause.

In my report, dated 1st August 1865, I remarked, in reference to the preponderating product of chinchonidine, which I could not help foreseeing: "This difficulty must be looked steadily in the face, and I would suggest that it may be obviated, either by a change being wrought in the opinion of the medical world as to the value of chinchonidine as a medicine, or by the plant being encouraged to produce quinine instead of chinchonidine."

The Secretary of State for India (Sir Charles Wood) lost no time in acting on the first of these suggestions, and consulted Sir Ranald Martin,† who entered cordially into the subject, and approved of both ideas. The result was, through Sir Charles Wood's recommendation to the Governor General of India,‡ the appointment of a medical commission, whose labours have been most advantageous. It is not for me to speak of their value to medical science, but to show the bearing of the report of this Commission on the cultivation of the *Chinchona succirubra*, as its outcome differs somewhat from what might have been anticipated.

The Commission has shown that all the alkaloids are to be relied upon more or less in the cure of intermittent fever, or, in their own language, "that they form a very valuable class of therapeutic agents," and (taking the order of the instructions sent to medical officers) they consider them to be—

1. Febrifuges, antiperiodics, and tonics.
2. Their general effects are similar to those of quinine, though perhaps in an inferior degree.
3. As variously estimated, they possess the same effects as quinine, to the extent of one-half or two-thirds.
4. They are very efficacious in treating the common fever of the country, and disordered digestion, &c., &c.
5. Their relative value seems to be:—

1. Quinine.	
2. Quinidine.	
3. Chinchonidine	} about equal.
Chinchonine.	

6. Their proper doses are—

Quinine	-	-	-	From 3 to 20 grains.
Quinidine	-	-	-	5 to 20 "
Chinchonidine	-	-	-	7 to 20 "
Chinchonine	-	-	-	7 to 20 "

It is clear that quinine keeps its long-maintained and acknowledged supremacy, and that next in order of merit we must place quinidine; but *quinidine* (except in some rare and quite exceptional cases) is what *C. succirubra* does *not* produce.

Then chinchonidine and chinchonine are looked upon as of equal efficacy, if we read the report aright.

There are other circumstances which lead to quinidine maintaining its price, and it seems to be, and probably will continue, the favourite next to quinine. But next to quinidine comes in, not chinchonidine, but chinchonine, the obvious reason being that it can be delivered at a lower price, in addition to which it is (at least in one of its combinations) a more convenient medicine to prescribe.

So we have, after all, chinchonidine rather falling behind in the race, and if the effect of this on the cultivation of *C. succirubra* be well considered, it will tend to confirm our doubts about the result.

We then come to the second of my suggestions,—Cannot the *C. succirubra* be encouraged to grow quinine, instead of chinchonidine? We have seen that its tendency is increasingly the reverse.

How can we alter this? The answer is certainly, not alone by *mossing*, as is strikingly shown by an analysis of Mr. Broughton's now before me, the unmossed bark yielding 2·18 per cent. sulph. chinchonidine, and the *old mossed* bark of the same parcel of *C. succirubra* not less than 4·66 per cent., whilst the quinine is less in this latter.

There remains the process of the re-formation of the bark over surfaces from which it had been removed. This gives rise to the production of lax cellular tissue, full of quinine (which I have described anatomically and chemically in "Quinology of the East India Plantations"). Mr. Broughton admits this fact,§ and it is doubtless familiar to Mr. M'Ivor, so that I am at a loss to understand why this plan is not pursued to a greater extent than appears to be the case. I have obtained large percentages of quinine from bark of this description, more than sufficient to repay the extra cost, unless there are circumstances

* In connection with the chinecho-tannic acid taking from the alkaloids oxygen, for which it has very strong affinity. Both the alkaloids contain a smaller amount of oxygen than quinine possesses.

† "Return," 18th June 1866, p. 136.

‡ "Return," p. 316. Letter dated 30th September 1865.

§ Return of 9th August 1870, page 195.

cumstances unknown to me which tend greatly to augment the cost of the operation, or to render it, from some cause, undesirable.

I have now stated the objections to the cultivation of *C. succirubra*. On the other hand, I am bound to say that its inherent good qualities have secured it a favourable reception in the English market, and a price which may probably be found satisfactory to the producers.

At a quite recent sale of bark grown on the Government plantations at Ootacamund, the "old mossed *succirubra*" brought 2s. 3d. per pound, the "small mossed *succirubra*" 2s. 6d. per pound, the "unmossed *succirubra*" realised 2s. 10d. per lb. These were all sold (as far as is known) for pharmaceutical purposes, whilst one parcel of "unmossed and old mossed *succirubra*" was sold for the extraction of quinine, and obtained 2s. 7d. the pound.

It is a favourable feature that the attention of leading druggists in London is being aroused to the merit of the article, and that the prices above-named were the result of the competition of purchases from the Continent with these in London.

I suggested to the Government, in June 1854, that the bark of the small branches might be advantageously sold for pharmaceutical preparations, and it now seems as if the bark of the whole tree would be welcome for the purpose. On the review of all that is apparent at present, I do not think it wise to rest the success of the cultivation on this one species; it cannot be looked upon as the quinine-tree of the future.

I come next in order to the *C. officinalis* and its varieties, representing in India the "Loxa" or "crown barks," which used to be supplied from South America to the European markets.

These latter may now be looked upon as belonging to the past, as none are forwarded at present from Hoja, and it is not very probable that the inertia of the people of those parts will be overcome so far as to cultivate them, and thus replace the worked-out forests. It is therefore a most fortunate circumstance that all, or nearly all, the varieties should have found so congenial a home as India.

There have now been several importations of the "*officinalis*" barks from different plantations in the East, and I can speak well of all I have seen, and that without any of those reservations which attach themselves to the former species. I have no doubt that these barks will improve with age, and they already command a price equal in some cases to that of *Calisaya*. That of the variety *Angustifolia*, if it can be produced equal to the specimen analysed by Mr. Broughton and myself, would of course realise a much larger amount. In reference to this sort, Mr. Broughton wrote to me, in April 1869, that "the flower did not appear to differ from the other *officinalis* blossom," and in July of the same year "some further experience quite supports your views that it is a *crown bark*. I can now trace all gradations into the *Bonplandiana* type." I may add, that having received dried specimens, which were gathered in the latter part of 1868 at Ootacamund and sent home by Mr. Batcock, I sowed some of the seed remaining in the capsules of one of these, which is marked "No. 6 (?), var. *C. officinalis*, var. *crispa*" (the duplicate of which, as of the other numbers, is in the Royal Museum at Kew). This appears to be the same as Mr. Batcock's "No. 4, *C. officinalis* (?), *crispa*," but differing widely from the real *crispa* of Tafalla.

From these seeds I obtained several plants, of which two remain. One of these is more like the parent, but the other plant represents exactly the "No. 11," or var. *angustifolia*. It appears to be a freely-growing sort, being at this time five feet in height, and having nearly a dozen small branches. This, for a three years' growth (under all disadvantages of cultivation under glass), promises well. Mr. M'Ivor wrote me, under date 29th June 1869: "We are now propagating the lanceolate *officinalis* from cuttings as fast as we can. It is, I believe, only a variety, and consequently it will not come true from seeds, and therefore the only way to get up a large stock quite true is by cuttings and grafts." In confirmation of its only being a variety, Mr. Broughton sent me specimens, of which he writes, under date October 1869, "I have a set of [*crispa*?] specimens just ready to send you. Those marked A, B, C, D, E are all from *crispa* seed. You will, I think, see a gradation in all characters between two marked types. I want your opinion on these."

These very well-selected specimens nearly bridged over the interval between the var. *Bonplandiana* and the var. *angustifolia*, to which latter I should assign C, D, and E, as differing by no specific tokens from the No. 4 and No. 6 above, nor yet from No. 7, which is termed "the strong growing variety." A and B are of a separate type.

I should like to take one further step to establish the specific identity of these forms,—to sow the seed from No. 11, and see whether it would not originate the other sorts. In the meantime, it remains to propagate diligently the var. *angustifolia*, by layers and cuttings, as Mr. M'Ivor was already doing in 1869. By this time the plants thus raised may have amounted to a large number, for the plant of *C. officinalis* (raised from seed from Uritusinga in 1859), which I had the honour to present to the Indian Government, gave rise, under the skilful care of Mr. M'Ivor, to many thousands in the same period; and the last I heard was that he hoped to plant 60 acres from that one tree. Now, it is easy to understand how valuable a plantation in suitable soil and climate of the var. *angustifolia* would be; but if this seems scarcely attainable it might, at all events, be easy to intersperse these among closely-set plants of the *C. officinalis* (in its other varieties), and to remove these latter year by year as required, cutting them down cleanly

to the root, and sending in the bark to the English market. This would pay all expenses, and then the more valuable trees might in the meantime acquire a large size, whilst between them an undergrowth of offshoots from the cut-down stems would be coming on for fresh cutting. I mention this plan in connection with the *C. officinalis* especially, because in these crown-barks the very youngest shoots that could be peeled have often been sold, and even preferred by the trade.

It will be seen how this bears upon the question of quick return of capital by some such plan as the above. There is no fear that the bark of these varieties of *C. officinalis* should deteriorate with age, so that the trees left might in time rival those of the Bolivian forests; in these there have been found specimens both of *calisaya* and *lanceifolia*, yielding as much as five per cent. of bark each; but it is not our own generation that will see such trees in India.

I have not much to remark in reference to the remaining varieties of *C. officinalis*. I have quite recently met* with the *Amarilla del Rey* (as well as the *Colorada del Rey*), once celebrated Loxa barks. These seem quite as good (chemically viewed) as their originals in South America, and might easily be so gathered as to please the eye of the druggists here. In the meantime I can entirely confirm the opinion expressed by Mr. Broughton, that this sort (the *officinalis* in its varieties) is "especially suited for export to Europe" for the purposes of quinine manufacture. I must also add that these barks are now required to fill up the vacancy occasioned by the cessation of the supply of the true Loxa or crown barks. The cessation, if not *absolute*, is *practically* complete, and is supplemented by the importation of miserable products *via* Guayaquil.

The species standing third in importance, according to the Report, is that of *C. calisaya*, of which the No. V. form appears to be the one to be encouraged. Considering the acknowledged superiority of these barks in South America, it must occur that there is something yet to be learned about them in India, causing them to take a higher place than the third rank. The No. V. form is not improbably the one found by Don P. Rada in the east of Bolivia, and described by me in the "Journal of Botany" in 1869. In that case it would form trees of from 120 to 150 feet in height, and still produce bark of fine quality. The analysis of Mr. Broughton shows a very promising kind.

It will be needful to guard the cultivators against the inferior sorts which (however they may be arranged botanically) will assuredly disappoint their expectations.

I am glad to notice that the grey bark trees, or the *C. micrantha* and *C. Peruviana*,† have been, to some extent, encouraged by Government, as these trees furnish chinchona in abundance and of a good quality, and this alkaloid is increasing so much in consumption that it will some day become important to have a readily available source to depend upon for its supply.

The Pitayo trees, of which there exists now a complete collection at Ootacamund (through the last mission of Cross), should, I think, be encouraged, as they not only furnish a good material for the extraction of quinine, but also of quinidine, which is coming into favour in some quarters.

In conclusion, I wish to add some remarks to dispel the fears which seem to be entertained by cultivators, that an excessive supply from India will so glut the market as to cause the prices to fall too low to be remunerative. I do not see any reason to fear this with reference to *really good barks*, which must always repay well the expense bestowed on their cultivation. There is no medicine in the world to rival quinine in its efficacy and in the extent of its consumption, and there is no probability that any artificially-formed product will ever take its place.

Then, as to the South American forests, it is clear that these cannot compete with skilfully-cultivated plantations in India. The very cost of transport, if nothing else, would hinder this.

It remains that the planters should not over-supply the demands of the world; this, indeed, is a *possibility*, but one so remote that it may be dismissed from all thought for at least the present generation; and the range of altitude above the sea-level and climate under which the chinchona can be profitably grown are at best extremely limited, as Mr. Broughton's Reports abundantly show, and it will be found eventually that the really productive plantations are not too numerous for profit.

I have, &c.

The Under Secretary of State for India.

(signed) John Eliot Howard.

* In importations from India.

† Also *C. nitida*.

— No. 19. —

(No. 4—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Duke,

Fort St. George, 15 February 1872.

WE have the honour to forward, for your Grace's information, our proceedings of 12th January 1872 (with the previous papers therein referred to), containing a letter from Mr. McIvor, instituting a comparison between the growth of chinchona plants in British Sikkim and on the Nilgiris.

2. We also forward our proceedings of 11th January 1872, embodying a letter from Mr. McIvor, refuting the statement published at pages 982 and 1000 of the Supplement to the "Gazette of India," dated 8th July 1871, to the effect that the chinchona plants, when originally supplied from the Nilgiris to Darjeeling, were affected with canker. Copy of the letter which we have addressed to the Government of India on the subject is also enclosed.

We have, &c.
(signed) *Napier, &c.*

Enclosure 1, in No. 19.

From the Superintendent, Government Chinchona Plantations, to the Commissioner of the Nilgiris; dated Ootacamund, 23rd October 1871.

1. WITH reference to the measurements of the chinchona plants taken by us at Neddivuttum on the 27th ultimo, in accordance with G. O. of the 26th May 1871, I have the honour to submit a comparison of the growth of chinchona plants in British Sikkim and on the Nilgiris.

2. The following Tables, on the plan adopted in my letter of 25th April last, give the result of four years' growth:—

Cinchona Succubra.	NEDDIVUTTUM.								DARJEELING.							
	Planted April to June 1867; Measured September 1871.								Planted February and March 1867; Measured February 1871.							
	Ten largest consecutive trees.				Ten smallest consecutive trees.				Ten largest consecutive trees.				Ten smallest consecutive trees.			
	No.	Height.	Circumference one foot from the ground.	Yearly growth.		Height.	Circumference one foot from the ground.	Yearly growth.		Height.	Circumference one foot from the ground.	Yearly growth.		Height.	Circumference one foot from the ground.	Yearly growth.
Height.				Circum- ference.	Height.			Circum- ference.	Height.			Circum- ference.	Height.			Circum- ference.
	ft. in.	in.	ft. in.	in.	ft. in.	in.	ft. in.	in.	ft. in.	in.	ft. in.	in.	ft. in.	in.	ft. in.	in.
1	14 10½	14½	3 8½	3½	11 5	10	2 10¼	2½	11 6	7	2 10½	1¾	5 10	2½	1 5½	½
2	15 9	15¾	3 11¼	3½	10 4	9¾	2 7	2½	15 0	7¼	3 9	1¾	4 0	3½	1 0	¾
3	14 9	14¾	3 8¼	3½	10 10	12	2 8½	3	13 2	8¼	3 3½	2	3 6	1½	0 10½	¾
4	14 0	13½	3 6	3½	10 9	10¼	2 8¼	2½	16 4	10½	4 1	2½	3 6	1¾	0 10½	¾
5	12 5	11½	3 1½	2¾	9 10¾	10½	2 5½	2½	11 16	4½	2 10½	1½	3 2	2	0 9½	¼
6	15 11½	14	3 11½	3½	11 5	11	2 10¼	2¾	12 7	7¾	3 1¾	2	4 3	2½	1 0¾	½
7	14 9	14½	3 8¼	3½	11 0	8	2 9	2	17 4	11½	4 4	2¾	1 11	¾	0 5¾	¼
8	14 11	13½	3 8¾	3½	11 9	12	2 11¼	3	15 9	11½	3 11½	2¾	3 1	2¼	0 9½	¾
9	15 7	14½	3 10¾	3½	11 9	14¾	2 11¼	3½	16 9	9¾	4 2¼	2½	2 7	1½	0 7¾	½
10	13 4	12	3 4	3	11 4	13½	2 10	3½	15 8	12½	3 11	3½	2 4	2	0 7	¼
Average	14 7½	13¾	3 8	3½	11 0½	11½	2 9½	2½	14 6¼	9	3 7¾	2½	3 5	2	0 10½	¼
Average of both finest and worst grown trees					12 10	12½	3 2½	3½	-	-	-	-	9 0	5½	2 2¾	1½

3. The above results show that on the Nilgiris four years' growth of *Cinchona Succirubra* exceeds that of the same species in British Sikkim by 3 feet 10 inches in height and 7 inches in circumference of stem, or three times the bark-producing surface. When the greater thickness of bark of the Nilgiri plants is taken into consideration, the yield may be estimated at about four times the quantity of bark produced during the same period of growth by plants of this species in Sikkim.

4. Our largest red-bark tree, planted in July 1864, measured 28 feet 5 inches in height and 24½ inches in circumference at one foot above the ground. The largest tree, planted in October 1865, measured 24 feet 4 inches in height and 18½ inches in circumference. These plants were the finest that could be found, and were considerably above the average. The largest tree found in the Sikkim plantations, planted in 1864, measured 24 feet in height and 17½ inches in circumference.

5. The following are the measurements of 10 consecutive plants of *Cinchona Calisaya* at Neddivuttum and Rungbee:—

Cinchona Calisaya.	NEDDIVUTTUM. Planted October, November, and December 1867 ; Measured September 1871.				DARJEELING. Planted June 1867; Measured February 1871.			
No.	Ten largest consecutive plants.				Ten largest consecutive plants.			
	Height.	Circum- ference one foot from the ground.	Average yearly growth.		Height.	Circum- ference one foot above ground.	Average yearly growth.	
			Height.	Circum- ference.			Height.	Circum- ference.
	ft. in.	in.	ft. in.	in.	ft. in.	in.	ft. in.	in.
1	9 1	7½	2 3½	1½	15 -	9	3 9	2½
2	8 9	7½	2 2½	1½	12 4	8½	3 1	3½
3	12 3	9	3 0½	2½	14 8	9½	3 6½	2½
4	8 6	9½	2 1½	2½	13 3½	7	3 3½	1½
5	8 2	6½	2 0½	1½	12 7½	6½	3 1½	1½
6	9 2	9	2 3½	2½	14 9	10½	3 8½	2½
7	7 10	6½	1 11½	1½	15 6	7	3 10½	1½
8	8 6	10	2 1½	2½	14 -	6½	3 6	1½
9	11 7	10½	2 10½	2½	14 8½	7½	3 8½	1½
10	9 9½	8½	2 5½	2½	15 -	7½	3 9	1½
Average	9 4½	8½	2 4½	2½	14 1½	7½	3 6½	2

giving an annual average growth of 1 foot 2½ inches less than the growth of this species on the Sikkim plantations, but the circumference of stem is in favour of the Nilgiri plants; the bark-producing surface of the main stem of the plants being nearly one-half more than those on the Nilgiris. When the additional thickness of bark is taken into account, the produce of *Cinchona Calisaya* on the Nilgiris will be about equal to that of the Bengal plantations.

6. Of all the species of chinchona cultivated on the Nilgiris, *Cinchona Calisaya* has made the most unsatisfactory growth, and consequently has not been cultivated to so great an extent as the *Cinchona Officinalis*, which grows freely, and yields a superior bark for the manufacture of quinine.

Enclosure 2, in No. 19.

From the Commissioner of the Nilgiris, to the Acting Secretary to Government,
Revenue Department, Fort Saint George; dated Ootacamund, 1st May 1871.

I HAVE the honour to forward Mr. McIvor's report upon the Bengal chinchona plantations.

2. The report seems carefully drawn up, and conveys valuable information. Mr. McIvor has purposely abstained from drawing any contrast between the Nilgiri plantations and those he visited, as he considers that any such comparison coming from him might appear invidious and uncalled for.

3. I quite enter into Mr. McIvor's feelings, and respect the principle which has guided him in framing his report; but I am led to take a different view of the necessities of the case. It is so easy to make plausible assertions as to the general condition of an extensive plantation that such statements are of little practical value. But where, as in the present case, with the plantations reported on, we have certain facts recorded, the result of actual measurement and observation of which we cannot doubt the accuracy, I submit that we ought to put the Nilgiri plantations to the same test, and contrast the results. In my judgment such a comparison is called for in the general interests of the State, and as having an important bearing on the inquiries made by the Secretary of State in his Chinchona Despatch, dated 19th May 1870, No. 13.

4. For example, in paragraph 6 of his report, Mr. McIvor has given the average yearly growth on the Bengal plantations of the *finest* ten consecutive plants selected by the head-gardener from among 256,000 four-year-old *succirubras*, and the average yearly growth of ten consecutive *badly*-grown plants of the same age. In paragraph 7 Mr. McIvor has given the dimensions of the largest *succirubra* tree to be found of those planted in 1864 and 1867. Why should we not, as a matter of fact and for purpose of contrast, have on record the average yearly growth of our ten *best* and *worst* four-year-old *succirubras*, and the dimensions of our largest 1864 and 1867 *succirubra*?

5. In like manner I would deal with the *calisaya* variety, as described in paragraphs 8 and 9 of the report.

6. If Government approve, I shall call upon Mr. McIvor to be good enough to carry out this comparison on the points referred to; and for Mr. McIvor's satisfaction, I shall be glad to be present when he measures our trees.

From the Superintendent of the Government Chinchona Plantations, to the Acting Secretary to Government, Revenue Department, Fort Saint George; dated Ootacamund, 25th April 1871, No. 9.

WITH reference to the Order of Government, No. 1,998, dated 10th December 1870, authorising me to visit the chinchona plantations of the Bengal Government in British Sikkim, I have the honour to submit the following observations on the condition and prospects of those plantations as a source of supply of chinchona-bark.

2. I would respectfully call attention to the fact that I visited the Himalayan plantations at a season of the year when the plants are in the worst condition. My observations were made during a short stay, and at an unfavourable time; and my impressions, as to the condition of chinchona cultivation in the North of India, might have been somewhat modified had my visit been made at a more favourable season.

3. The quinine plantations in Bengal are situated in the Valley of Rungbee, on the Himalayas, about 13 miles from Darjeeling. This valley opens on the plains to the south-east, is entirely sheltered by surrounding hills, and its general appearance is strongly marked by indications of a locality possessing every requirement for the successful growth of chinchona. The natural forest-trees are overgrown with moss, and the undergrowth is ferns. The climate is very moist, especially in the higher portions where the ridges attract the clouds, and an almost perpetual drizzle or mist prevails, except during two months of the year, when the weather is comparatively fine, with occasional showers.

4. At one time the Valley of the Rungbee must have been covered with heavy virgin forest, which has long ago fallen under the axe of the native cultivator, and the land has for years been cropped with raggy, Indian corn, and wheat. The ground not being capable of producing a succession of these crops is, on its becoming exhausted, abandoned, and after a few years the surface gets covered with a growth of scrubs and long grass. This has been cleared, and the chinchona plantations formed on the land. The general lie of the ground is steep and rugged, with here and there marks of ancient, and modern landslips of formidable proportions. There is very little surface-soil. It has apparently been exhausted by previous cropping, or washed away by the heavy rains when the land was under native cultivation.

5. The plantations in British Sikkim, both public and private, are, as a whole, in an unsatisfactory condition. They are exceedingly patchy and irregular, not one-third of the extent of land under cultivation having produced plants of fair growth, while large patches exist in which the plants have died out altogether. There are, however, here and there a few fine patches, and some exceptional plants have made extraordinary vertical growth, much exceeding that on the Nilgiris; but even these plants have not the robust habit and luxuriant foliage which characterise the plants of Southern India. The whole of the plants which I saw in British Sikkim are sparsely-leaved and long-jointed, and have attained little more than half the circumference of stem which plants of the same height have on the Nilgiris.

6. In the Sikkim plantations the plants are placed close together—*C. Succirubra* and *Calisaya*, at 6×6 feet, or 1,210 plants to the acre; *C. Officinalis* and *Pahudiana*, about 4,500 plants to the acre. The number of acres of plants on the Bengal plantations in September last was 1,134. The total number of plants planted out at the end of each year on the plantations from 1864, the date on which the permanent plantations were formed, to September 1870, was as follows :—

TABLE

TABLE showing Total Number of PLANTS and Acreage at the end of each year.

Total number planted in	C. Succirubra.		C. Calisaya.		C. Micrantha.		C. Officinalis.		C. Pahudiana.		TOTAL.	
	Number of Plants.	Acres of 1,210 Plants.	Number of Plants.	Acres of 1,210 Plants.	Number of Plants.	Acres of 4,500 Plants.	Number of Plants.	Acres of 4,500 Plants.	Number of Plants.	Acres of 4,500 Plants.	Number of Plants.	Acres.
1864 - -	389	0.32	-	-	15	-	270	0.06	92	0.02	766	0.40
1865 - -	389	0.32	-	-	15	-	870	0.19	2,162	0.48	3,436	0.99
1866 - -	31,387	25.93	3	0.02	158	0.04	30,640	6.81	5,092	1.13	67,280	33.93
1867 - -	256,143	211.69	150	0.12	5,558	1.24	130,919	29.09	5,092	1.13	397,862	243.27
1868 - -	576,618	476.54	220	0.18	29,667	6.59	312,719	69.49	5,092	1.13	924,316	553.93
1869 - -	1,002,100	828.18	2,330	1.03	29,667	6.59	406,899	90.43	5,092	1.13	1,446,088	928.26
30th Sept. 1870 - -	1,219,715	1,008.03	24,860	20.54	29,667	6.59	440,000	97.78	5,092	1.13	1,719,334	1,134.07

Of the above, the *C. Succirubra* (red bark) has made the most satisfactory growth. The finest 10 consecutive plants of this species which could be selected, by Mr. Grammie, out of 256,000 planted in February and March 1867, measured on the 25th February 1871—

	Height.	Circumference One Foot from Ground.	AVERAGE YEARLY GROWTH.	
			Height.	Circumference.
	<i>Ft.</i> <i>In.</i>	<i>In.</i>	<i>Ft.</i> <i>In.</i>	<i>In.</i>
Number 1 - - - -	11 6	7	2 10½	1½
" 2 - - - -	15 0	7½	3 9	1⅞
" 3 - - - -	13 2	8¼	3 3½	2
" 4 - - - -	16 4	10½	4 1	2⅝
" 5 - - - -	11 6	4½	2 10½	1⅞
" 6 - - - -	12 7	7¾	3 1¾	2
" 7 - - - -	17 4	11½	4 4	2⅞
" 8 - - - -	15 9	11½	3 11½	2⅞
" 9 - - - -	16 9	9¼	4 2¼	2¼
" 10 - - - -	15 8	12½	3 11	3⅞

giving an average vertical growth of 3 feet 7¾ inches per annum, and an average increase of circumference of stem, at one foot from the ground, of 2¼ inches per annum. Ten consecutive badly-grown plants of the same age, selected for measurement on the same patch, gave the following :—

	Height.	Circumference One Foot from Ground.	AVERAGE YEARLY GROWTH.	
			Height.	Circumference.
	<i>Ft.</i> <i>In.</i>	<i>In.</i>	<i>Ft.</i> <i>In.</i>	<i>In.</i>
Number 1 - - - -	5 10	2½	1 5½	⅝
" 2 - - - -	4 0	3½	1 0	⅞
" 3 - - - -	3 6	1½	0 10½	⅜
" 4 - - - -	3 6	1½	0 10½	⅜
" 5 - - - -	3 2	2	0 9½	⅜
" 6 - - - -	4 3	2½	1 0¾	⅝
" 7 - - - -	1 11	¾	0 5¾	¼
" 8 - - - -	3 1	2¼	0 9¼	⅝
" 9 - - - -	2 7	1½	0 7¾	⅜
" 10 - - - -	2 4	2	0 7	⅜

or an average vertical growth of $8\frac{1}{2}$ inches, and an increase in circumference of half an inch. The mean of the two measurements gives the vertical annual growth of this species at 2 feet $2\frac{1}{4}$ inches, and an increase of circumference of $1\frac{1}{2}$ inches. But this estimate affords too high an average, as the plants have grown badly on considerably more than one-half of the plantations.

7. The largest plant of *C. Succirubra*, planted in 1864, is 24 feet high, and the stem $17\frac{1}{4}$ inches in circumference at a foot from the ground. Only a few plants of that season's planting remained at the date of my visit, many having died of canker. The largest plant of this species planted in 1867 also measured 24 feet in height, with a circumference of stem of 13 inches.

8. The cultivation of *C. Calisaya* (yellow bark) in British Sikkim may be said to have just begun, as only three plants of this species were planted in 1866, 150 in 1867, and 220 in 1868. These latter plants are of a very valuable description, and were raised from the seeds imported by Mr. J. W. B. Money. The growth of the *Calisaya* is equal to that of the *C. Succirubra*, while the bark produced by this species is very superior for the manufacture of quinine. Ten consecutive plants of *C. Calisaya*, the finest that could be selected by Mr. Grammie, and planted on the 29th June 1867, gave the following measurements:—

	Height.	Circumference One Foot from Ground.	AVERAGE YEARLY GROWTH.	
			Height.	Circumference.
	Ft. In.	In.	Ft. In.	In.
Number 1 - - - -	15 0	9	3 9	$2\frac{1}{4}$
" 2 - - - -	12 4	$8\frac{1}{2}$	3 1	$2\frac{1}{4}$
" 3 - - - -	14 3	$9\frac{1}{2}$	3 $6\frac{1}{2}$	$2\frac{3}{8}$
" 4 - - - -	13 $3\frac{1}{2}$	7	3 $3\frac{1}{2}$	$1\frac{1}{2}$
" 5 - - - -	12 $7\frac{1}{2}$	$6\frac{3}{8}$	3 17	$1\frac{5}{8}$
" 6 - - - -	14 0	$10\frac{1}{2}$	3 $8\frac{1}{2}$	$2\frac{5}{8}$
" 7 - - - -	15 6	7	3 $10\frac{1}{2}$	$1\frac{1}{2}$
" 8 - - - -	14 0	$6\frac{1}{2}$	3 6	$1\frac{1}{2}$
" 9 - - - -	14 $8\frac{1}{2}$	$7\frac{1}{2}$	3 $8\frac{1}{2}$	$1\frac{1}{2}$
" 10 - - - -	15 0	$7\frac{1}{2}$	3 9	$1\frac{7}{8}$

or an average vertical growth, annually, of 3 feet $6\frac{1}{2}$ inches, with an increase of circumference of stem of two inches. These plants were growing on the finest land on the Rungbee plantation.

9. The best plant of *C. Calisaya* measured 18 feet 2 inches in height, with a stem of 9 inches in circumference at a foot above the ground, a growth which is extraordinary, and would promise the best results, were it not that canker has already made its appearance among these plants, not only in the older plants, but to some extent in the plants of 1869. At the date of my visit small patches had begun to die. The growth of the *Calisaya* in British Sikkim appears in every respect equal, but in no way superior to that of the red bark.

10. *Cinchona Micrantha* (grey bark) cannot, in my opinion, be grown successfully on the Himalayas. The plantations of this species are very patchy. The plants appear to make satisfactory growth for about two years only, while the red and yellow barks on good ground grow well for three years. Upwards of one-half of the entire number of plants of *C. Micrantha* are already dead, and a few only are free from canker.

11. *Cinchona Officinalis* (crown-bark), which is, perhaps, the most valuable of all the species grown in India, has not succeeded in Bengal. Of the plants of this species at least three-fourths are already dead, and I believe that there is not a plant on the whole of the Government plantations free from canker, and this to such an extent as to stop the growth of the plants.

12. *Cinchona Pahudiana* is a species of comparatively little value; this, also, has not been successfully cultivated on the Himalayas, the plants being much in the same condition as the *C. Officinalis*.

13. The few plants of *C. Pitayensis* in British Sikkim have not as yet been placed in permanent plantations; it was therefore impossible to form any opinion of the success which may attend the cultivation of this sort.

14. From what has preceded, it would appear that if a supply of quinine-bark is to be produced in British Sikkim, it can only be obtained from *C. Succirubra* and *Calisaya*,
and

and that the cultivation of *C. Micrantha*, *Officinalis* and *Pahudiana* must be abandoned. The *C. Succirubra* is undoubtedly the best species for the supply of mixed alkaloids, such as have been successfully used in the hospitals of India. The *C. Calisaya* is one of the best species for the production of pure quinine. If, therefore, from these two species an ample supply of bark can be produced, it will meet all requirements of the Indian Government and the home manufacturer.

15. It is, therefore, with the deepest regret I have to inform the Government that, in my opinion, permanent plantations of these species cannot be formed in British Sikkim. The disease, which has rendered impossible the successful cultivation of *C. Micrantha*, *Officinalis*, and *Pahudiana*, has also made very serious inroads on, and threatens ultimately to destroy, the plantations of *C. Succirubra* and *Calisaya* also.

16. The disease known as canker generally arises from excessive damp, or a damp sub-soil: and this would appear to be the cause of disease in the Sikkim plantations. All species seem to thrive in good land for one or two years after being permanently planted out, and the *Calisaya* and *Succirubra* for three years. At this age it appears to me the disease begins to make rapid progress among the red-bark plants. I must state, however, that I am informed by Mr. Clarke, the superintendent of the plantations, and by all his assistants, that the canker, especially among the *C. Succirubra* or red-bark plants, was decidedly on the decrease. These gentlemen have local experience and extensive observations of the plantations, and their opinions are therefore entitled to greater weight than mine; nevertheless, I am constrained to state that I cannot coincide in their opinion, and my impression is that the disease is on the increase. This impression is forced on my mind by the fact that the disease shows itself on numerous spots, here and there, throughout the plantation, wherever the soil is thin or the land damp. The plants on these spots made little or no growth; the leaves become yellow and unhealthy. The bark of the stems cracks, becomes rugged and knotty, and in the centre of these knots, or protuberances on the bark, a dark spot of decay appears. This spot penetrates the bark and wood of the stem of the plant, and extends sometimes horizontally and sometimes perpendicularly, destroying the tissues of the bark and wood, which becomes perfectly dead and dry. That this dead and dry portion of the stem can ever be renewed by any process in the action of the plant appears to me impossible, nor did I observe in any one instance, although I examined thousands of plants, any appearance of the healthy wood throwing a fresh deposit of bark over the decayed part; but in all instances the decay was encroaching rapidly on the living part of the plant. This also appears clearly established by the fact that the canker continuously spreads from the small points on which it originates, until, in the plantations of three and four years of age, the disease has so encroached on the fine patches that only a few healthy plants remain to the acre, while acres together have entirely died out from the progress of the disease. The young portions of the plantations are almost free from the disease, except in such spots where the soil is thin and the damp is near the surface. The steady spread of the disease from such points is so marked and visible that I believe so soon as the roots of the plants that now appear healthy penetrate into the sub-soil, the disease will show itself more or less in these also. Of course the greater the depth of the surface-soil, the greater will be the growth, and the longer will the disease be in making its appearance. This is clearly illustrated by a general view of the plantations. The plants upon rich deep bamboo-land have made very satisfactory growth, and in some parts have attained four years' growth before they have become seriously affected with canker. A tract of this description of land of about 30 acres, adjoining the bungalow on the Rishap plantation, must have been for the first three years of its growth as fine a piece of chinchona-planting as could be found in any part of the world, but unfortunately at the time of my visit canker had made its appearance to a large extent in this also.

17. In some parts a great addition has been made to the depth of the surface-soil by the earth excavated from the road being thrown on the lower side. The plants on these parts have for the first three or four years made vigorous and satisfactory growth, but after this time canker has appeared here also. Here and there very large pits have been made by the natives in excavating the roots of the wild yam. These pits have in course of time been filled in by the wash of rich surface-soil, and the plants accidentally placed in these pits have made wonderful vertical growth; and although the older plants are not so luxuriant as the younger ones, still I did not observe any appearance of disease; I am therefore impressed that had the plantations been formed on rich virgin forest-land, the success would have been much greater, although it is probable that even under such circumstances the plantations, after a lapse of eight to ten years, would become diseased in consequence of the roots penetrating into the damp subsoil.

18. The private plantations in British Sikkim are in much the same condition as those of the Government. That of the Darjeeling Chinchona Association is, perhaps, on the whole better, while the *C. Officinalis* on the Tukvur plantation is decidedly in much better condition than this species on the Government plantations. Tukvur is a much drier climate than Rungbee, and it is strange that here the red-bark plants are in the same condition as on the Government plantations.

19. The cost at which chinchona-bark can be grown in British Sikkim cannot at present be estimated with any degree of certainty. Trees of equal height do not produce so much bark as in the South of India. This arises from the more slender growth and

thinner bark of the plants in British Sikkim. Three selected red-bark trees above the average of the best on the Rishap plantation gave 6 seers or 12 lbs. of fresh bark. Only the stem and best branch bark was taken, the yield of dry bark being about $3\frac{1}{2}$ lbs. These trees were nearly four years old when cut down. On the 185 acres planted in 1867, taking the whole extent together, there were not on an average more than 70 such trees to the acre.

20. On the 30 acres of red bark near the Rishap bungalow, already mentioned as being the finest and most uniform on the Sikkim plantations, each alternate row of plants was cut down when $3\frac{1}{2}$ years old. The produce obtained from these plants was 40 maunds of dry stem and branch bark. The quantity of bark in the trees left standing on the ground would thus be 40 maunds also. Previous to the alternate line of trees being removed, about 20 maunds of bark from thinnings had been obtained from the same piece of ground. I thus estimate that if these 30 acres had been entirely cut down, it would have yielded a total produce of 100 maunds, or 8,200 lbs. of dried stem and branch bark, or 273 lbs. per acre. This bark would be worth in London, at present market rates, from 7 *d.* to 2 *s.* per lb., or would have realised an average of 1 *s.* $3\frac{1}{2}$ *d.*, giving a total sum of 5,296 rupees, or *Rs.* 175. 12 *a.* per acre.

21. If the cost of collecting the bark, drying, packing, carriage, freight, insurance, agency, brokerage, &c., amounted in all to 53 rupees per acre, a sum will be left of *Rs.* 122. 12 *a.* per acre as the entire return of the finest acres of *C. Succirubra* in British Sikkim when $3\frac{1}{2}$ years old.

22. The patchy and irregular growth of the plantations, however, renders the result given above far too high as an average. From a careful examination of the 185 acres planted in 1867, of which the above 30 acres form a portion, I was strongly impressed that the 30 acres would produce more bark than the remaining 155 acres; but supposing the 155 acres capable of yielding double the amount of the 30 acres, or 16,400 lbs., the average return per acre would be reduced to about 60 rupees, instead of *Rs.* 122. 12 *a.*

23. In the fourth year of the age of the plants at Rungbee, it appears desirable that they should be cut down for the bark, this being the best time to secure vigorous shoots from the stumps; because, if a longer time for the growth of the plants is allowed, the disease makes such progress that the stumps will not throw shoots. The fresh shoots throw new surface-roots from beneath the points from which they spring from the old stools. I am, therefore, of opinion that the suckers thus treated would grow well for three or four years before they are seriously affected by canker. In this way, for a time at least, a crop might be obtained every third or fourth year from the best parts of the plantation, but more than half of the land already planted will never produce trees of sufficient size to give bark of any commercial value. The close planting practised in the Rungbee plantations is admirably adapted for this system of treating the plants.

24. The rough system of cultivation adopted in the Sikkim plantations is well described in the report of Mr. Clarke, the acting superintendent of the plantations, dated 10th July 1870, paragraph 28. The climate and local circumstances render this sort of cultivation necessary at Rungbee, as to cultivate and dig up the land in such a wet climate and on steep slopes would cause much of the soil to be washed away; but it is a system that cannot be practised on the Nilgiris, as under it our plants make slender and unsatisfactory growth, and many would die during our dry weather; moreover, the plantations would be liable to entire destruction by fire, and this is a danger from which they are not entirely free even in the moist region of Rungbee. The examination of the Sikkim plantations strongly impresses me with the desirableness of maintaining a high system of cultivation with all plants under six years of age on the Nilgiri plantations. After the plants attain this age they can be safely left without cultivation.

25. On the Himalayas they possess many advantages which at first sight would indicate that locality to be the best suited for the production of quinine-bark. They have an unlimited extent of land perfectly sheltered and free from heavy storms, which occasionally do so much harm to the plantation on the Nilgiris; they have an abundant and good supply of cheap labour; they are free from the severe and continuous drought to which we are subjected: against these advantages are to be placed what, in my opinion, forms an insuperable obstacle to the successful growth of chinchona, namely, the cold damp subsoil, an excessively moist climate, with extremes of temperature during the winter and summer months.

26. On the Sikkim plantations I did not observe any seedlings springing spontaneously from the seed which had fallen from the older trees. On the Nilgiri plantations thousands of such seedlings spring up yearly, and many have attained a height of from 8 to 10 feet. The manner in which self-sown plants establish themselves on the Nilgiris indicates a climate which cannot be otherwise than suited to the growth of the plants.

ORDER of the Madras Government thereon, 26th May 1871.

THE Government consider that such a comparison as Mr. Brecks proposes would be both interesting and useful. He will associate himself with Mr. McIvor as suggested.

Enclosure 3, in No. 19.

From the Commissioner of the Nilgiris, to the Secretary to Government, Revenue Department, Fort St. George; dated Ootacamund, 13th December 1871

IN accordance with the Under Secretary's letter of the 27th October 1871, I drew, Mr. McIvor's attention to the statement made by Mr. Munro at page 982 of the Supplement to the "Gazette of India," dated 8th July 1871, namely: "We received our first (chinchona) cuttings from the Nilgiris, and these were extensively affected with canker;" and to the remark in paragraph 4 of Mr. Secretary Hume's letter (page 1,000 of Supplement), to the effect that the canker, which has attacked the plants at Rungbee, "is shown to have existed in the plants originally sent up from the Nilgiris as stock for the Sikkim plantations."

2. As directed, I forward Mr. McIvor's remarks, which are pertinent, and, to my mind, conclusive.

The weight due to Mr. Munro's statement is not difficult to determine with the aid of Mr. McIvor's explanation, that the Darjeeling Association never received any cuttings from the Nilgiris in Mr. Munro's time, and that Mr. Munro did not arrive at Pomong until the Nilgiri plants originally supplied had been nearly two years, and the last supply fully ten months, in Bengal.

It was not the object of the Chinchona Commission to discover whether the disease came from this or that district, and, therefore, Mr. Munro's statement passed unchallenged; nor is it worth while now, I apprehend, to ask him to refresh his memory by the light of Mr. McIvor's letter.

3. There remains Mr. Hume's statement.

I have read the Chinchona Commissioners' Report, and am at a loss to understand how Mr. Hume arrives at the conclusion that the disease "is shown to have existed in the plants originally sent up from the Nilgiris."

Mr. Munro's random assertion is the only evidence that the Nilgiri plants were cankered; yet this single unexamined statement, made seven or eight years after the last supply of Nilgiri plants to Bengal, by a witness who could not speak from his own experience, is accepted by Mr. Hume as conclusive, and is made public, with the authority of the Government of India, in the face of Dr. Anderson's testimony at the time to the "vigorous growth and excellent condition" of the Nilgiri plants imported by him.

4. Such a hasty statement is hardly creditable to a department lately created, in order that "special attention might be devoted to many branches of administration now unavoidably more or less neglected, or but imperfectly dealt with."

From the Superintendent, Government Chinchona Plantations, to the Commissioner of the Nilgiris; dated Ootacamund, 6th December 1871.

I HAVE the honour to acknowledge your letter of the 31st ultimo, calling my attention to pages 982 and 1,000 of the Supplement to the "Gazette of India" of 8th July 1871, in which is published the Report of the Bengal Chinchona Commission, and asking me for an explanation of the evidence given by Mr. Munro, namely, that "we received our first cuttings from the Nilgiris, and these were extensively affected with canker;" and to paragraph 4 of the Proceedings of the Governor General in Council, where the canker in the chinchona plants in Sikkim is said to be "a disease which is shown to have existed in the plants originally sent up from the Nilgiris as stock for the Sikkim plantations."

2. In reply, I beg to state that I am not aware of the facts on which the Government of India have come to the above conclusion, but if the original 204 plants of chinchona, selected by Dr. Anderson in December 1861 from our stock on the Nilgiris, and conveyed by that gentleman to Bengal, were really cankered plants, it is remarkable that

there should have been no mention of this fact until 1871. The reports by the gentlemen in charge of the Bengal plantations describe the plants to be in the "highest health" and "growing most vigorously." It appears impossible that responsible, scientific, and practical gentlemen should have continued for years to furnish such favourable reports on plants which were affected with disease from the first.

3. When viewed in connection with recorded facts many of the statements made before the Chinchona Commission appear contradictory and impossible. This is especially the case with reference to the evidence of Mr. Munro. It is, therefore, to be regretted that that gentleman was not asked to explain the facts on which he made the statement above quoted. It is quite certain, from a careful examination of the records, that Mr. Munro never received any cuttings from the Nilgiris. In fact, Mr. Munro did not arrive at Pomong until December 1863, or when the original plants sent from the Nilgiris as stock for the Sikkim plantations had been nearly two years, and the last supply fully ten months, in Bengal. Thus it was impossible for him to know whether such plants were healthy or otherwise when they left the Nilgiris.

4. At page 981, in reply to Question No. 2, Mr. Munro states: "But my present plantation of 500,000 (*C. Succirubra*) plants have been raised by cuttings from 92 plants." This is an error, as I supplied a quantity of excellent seeds to the proprietors of the Pomong plantations, Mr. Lloyd and Colonel Angus. These seeds germinated freely, and probably produced from 50,000 to 100,000 seedlings. The seeds were gathered from plants which never had an indication of disease, and at the present moment are fine forest trees.

5. Another instance of the manner in which the evidence given before the Chinchona Commission is ill-considered, and likely to mislead, occurs at page 985, where Mr. Mann, in referring to the plants planted out in Sikkim in 1864, says: "Ten per cent. were old exhausted stock plants from the Nilgiris." Mr. Mann did not arrive in India till the 14th March 1864, or one year and two months after the last supply of Nilgiri plants arrived in Bengal.

6. It appears to be assumed that the Sikkim plantations were stocked with plants from the Nilgiris only. But the records show that the stock was obtained as follows:—Dr. Anderson raised in April and May 1861 in the Calcutta Botanic Gardens 120 seedlings* from seeds of *C. Micrantha*, *C. Succirubra*, and *C. Peruviana*, obtained by Mr. Markham from South America. Of *C. Pahudiana*, 548 seedlings were raised in Calcutta in December 1861, and the early part of January 1862 from Java seeds. Two hundred and four plants reached Calcutta from the Nilgiris on the 13th January 1862, and the second and last supply of 350 plants from the Nilgiris† arrived in Calcutta on the 30th January 1863. Of *C. Officinalis*, 11 plants‡ were received from Ceylon on the 28th January 1863, and 1,373 additional plants of *C. Pahudiana* from Java seed had germinated on 1st April 1863. In March 1866 Dr. Anderson raised 3,100 seedlings§ of *C. Officinalis* from seeds received in January 1866 from Mr. Thwaites, Ceylon, and 8,000 seedlings|| from seeds received from the same source in March 1866. During 1866–67, 38,500 seedlings, and in 1867–68, 101,175 seedlings were raised in the Sikkim plantations.

7. Thus the Sikkim plantations received large supplies of seeds and plants from other sources than the Nilgiris; the Nilgiris merely furnishing the principal stock of *C. Calisaya* and *C. Succirubra*. The Sikkim stock of *C. Officinalis* was raised principally from seeds from Ceylon, and it is worthy of note that the entire stock of this species has been so seriously affected with canker as to cause the cultivation to be abandoned. The Sikkim stock of *C. Pahudiana* raised solely from Java plants and seeds has also been destroyed by canker. The Java variety of *C. Calisaya* (*C. Josiphiana*) has been so affected by canker that only one plant existed on the Sikkim plantations at the date of my visit in February 1871 out of all the plants received of this variety. It is thus a matter of record that disease in the Sikkim plantations has not been confined to plants produced from the Nilgiri stock; disease, in fact, having made even more serious inroads on the plants and seedlings from South America, Ceylon, and Java. The *C. Succirubra* and *C. Calisaya*, the principal stock of which were supplied from the Nilgiris, are the only species which give a hope of successful culture in Sikkim. It, therefore, may be fairly assumed that the stocks of these plants were at least as healthy as any procured elsewhere.

8. I shall now notice what Dr. Anderson states to have been the condition of our plants. That gentleman visited the Nilgiris on the 17th December 1861, and that he was not favourably impressed with anything we had done is abundantly illustrated in his Report to the Secretary to the Government of India of 14th February 1862. In this Report Dr. Anderson condemns all the sites on the Nilgiris as unsuited to the growth of chinchona.

* Report of Botanical Gardens, Calcutta, from April 1861 to April 1862, by T. Anderson, Esq.

† Annual Report of Chinchona cultivation in British Sikkim, dated 30th April 1863.

‡ T. Anderson, Esq., to Junior Secretary to Government of Bengal, 1st May 1866.

§ Report of the Sikkim plantations from 1st April 1865 to 31st March 1866, by T. Anderson, Esq.

|| Report on the cultivation of Chinchona in Bengal for the year 1867–68.

chona. He asserts that the plants require "dense shade," and that our attempt to grow a "shade-loving tree" in such "unnatural places as cleared gardens" will end in "complete failure." This depreciation also extends to our plants, as Dr. Anderson, in the same Report, at paragraph 8, states, "The season is now too far advanced for the despatch of plants to Java, and the plants at the Nilgiris are not at all adapted for transmission to a distance, as plants artificially propagated, as they have been, cannot bear the risk of a long journey without a few months' preparation. Of those I brought, the short journey from the Nilgiris to this, I lost nearly 10 per cent., while the plants from Java, which were seedlings, can hardly be said to have suffered at all." Again, at paragraph 6, Dr. Anderson, referring to the Nilgiri plants, says, "These arrived in tolerable order, considering the loose manner in which Mr. Melvor, from want of time, was obliged to pack them. About 13 plants out of 204, the entire number received, have been seriously damaged; the remainder, in the present genial climate of Calcutta, have quite recovered, and are as healthy as at Ootacamund." Again, at paragraph 20, Dr. Anderson states that "193 plants" out of the 204 were "growing most vigorously" in the Calcutta Botanical Gardens on 19th January 1862. This reduces the loss to less than $5\frac{1}{2}$ per cent.

9. The whole of the above gives a most erroneous impression, as the loss of the plants was neither owing to artificial propagation, or to being carelessly packed, but was wholly caused by an accident which Dr. Anderson describes in his Report on the Botanical Gardens, Calcutta, from April 1861 to April 1862, in these words: "While I was at Ootacamund I procured 204 plants belonging to four other species of chinchona, besides those I obtained in Java. Several of these plants were destroyed between the foot of the Nilgiris and the railway station by the upsetting of one of the carts on which the Wardian cases were carried."

10. The last batch of plants forwarded from the Nilgiris as stock for the Sikkim plantations were prepared by me in December 1862, and are thus mentioned by Dr. Anderson in his Report on the Sikkim plantations, from 1st April 1862 to 30th April 1863: "These plants were obtained from Madras on the 31st January 1863, and of the original number, 350, obtained from Madras, only 23 had been lost between Calcutta and Darjeeling during the two months that had intervened from the date of their arrival in Calcutta and their reaching Darjeeling." Dr. Anderson speaks of the same plants in his letter to Sir William Denison, dated 9th March 1863, as follows:—"You will probably like to hear that the chinchona plants supplied to me from Ootacamund arrived here in excellent condition; they are still in the gardens, and have grown much, most of them having made three pairs of leaves since their arrival here. The weather is now getting too hot for all of them, except *C. Succirubra*."

11. On the Nilgiris we received, on the 9th April 1861, in all 463 plants of *C. Succirubra* from South America, and those plants had been about eight months on these hills at the time Dr. Anderson selected the plants for Bengal. Dr. Anderson thus describes our plants at the date of his visit (December 1861): "With the exception of a few plants recently placed in the open air nurseries at Neddivuttum, all the chinchona plants on the Nilgiris are growing in the conservatories in the Government Gardens at Ootacamund, where, protected from the vicissitudes of the weather, and in a recently erected house, even under the influence of artificial heat they are growing luxuriantly." Dr. Anderson selected his 204 plants from 3,500, which were prepared to be sent to the Neddivuttum Nurseries, and the whole of the remainder of these plants, namely, 3,296, were subsequently planted on the first Denison plantation, and now form a fine chinchona forest. No disease has ever appeared among any of these plants. During this year we have taken the bark from the stems of 1,000 of these trees, and they have yielded upwards of three pounds of dry bark each; the trees, notwithstanding the removal of the bark, still continue to maintain their usual health and vigour.

12. In conclusion, I would desire to bring prominently forward the following facts:—First, for many years, subsequent to the receipt of the Nilgiri plants, Dr. Anderson and the other gentlemen in charge of the plantations speak of them as in the "highest health" and "growing most vigorously," &c.;* second, the plants and seedlings received from other

* From the Officiating Superintendent, Royal Botanic Gardens, to the Secretary to the Government of India, 11th February 1862.

20. * * * "The plants are in very good health, and *C. Succirubra*, *C. Calisaya*, and *C. Pahudiana* are growing most vigorously, and seeds *C. Pahudiana* are coming up daily."

FIRST ANNUAL REPORT on Chinchona Cultivation in British Sikkim from 1st April 1862 to 30th April 1863, by the Officiating Superintendent of the Botanic Gardens, Calcutta.

"I am glad to be able to report that on my visiting the Chinchona Nursery at Lebong in the end of May, I found all the plants in the highest health, and that the propagation of all the species, except *C. Pahudiana*, was advancing rapidly."

other places than the Nilgiris, are, if anything, more extensively diseased than those raised from the Nilgiri stock; third, that Dr. Anderson selected his own plants (204) out of 3,500; the remaining 3,296 were planted out on the Nilgiris. No trace of disease has ever shown itself in these plants, and they are at the present time as fine trees for their age as any in the world; fourth, the loss of the 11 plants mentioned by Dr. Anderson was owing to an accident, and not to artificial propagation or loose packing.

— No. 20. —

(No. 7—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Duke,

Fort St. George, 29 February 1872.

IN continuation of our Despatch, dated 21st September 1871, No. 41, we have the honour to forward, for your Grace's information, the accompanying tabular report on the progress and condition of the Chinchona plantations on the Nilgiris for the half-year ending 31st January, 1872.

We have, &c.,
(signed) A. J. Arbutnot, &c.

REPORT on Chinchona Cultivation, at *Darjeeling*, from 1st April 1863 to 15th July 1864, by the Superintendent, Botanic Gardens, *Calcutta*.

"It is, however, deserving of notice, as showing the great suitability of the climate of Darjeeling for the species *C. Officinalis* (var. *Bonplandiana*), that the rate of increase of that species has been nearly 2,000 per cent. during the same period. The rate of increase is now most satisfactory, and the cuttings obtained monthly are large and healthy."

From the Superintendent of the Botanic Gardens, *Calcutta*, to the Junior Secretary to the Government of Bengal, 18th February 1865.

"The condition of the plants is in the highest degree satisfactory, considering the removal of almost all from Lebong to Rungbee, a distance of about 20 miles."

REPORT on the Cultivation of Chinchona at *Darjeeling* during the Month of April 1865.

2. "The growth of the plants has everywhere been most satisfactory, and especially at the lowest plantation the condition of the plants of all species could hardly be surpassed."

REPORT on the Cultivation of Chinchona at *Darjeeling*, from the 1st April 1865 to 31st March 1866, by the Superintendent, Royal Botanic Gardens, *Calcutta*.

"I am glad to be able to report that the cultivation of chinchona at Darjeeling has, during the past year, been attended with the greatest success."

"The stock plants of all the species are in the finest condition, and the 37,000 plants of *C. Succirubra* and *C. Officinalis* intended for the permanent plantations to be commenced in April, are strong and healthy."

REPORT on the Cultivation of Chinchona in *Bengal* for the Year 1867-68.

"The cultivation of chinchona has been most successfully carried on during the year. The number of plants propagated has far exceeded the amount added to the chinchonas during any previous year."

From the Officiating Superintendent, Botanic Gardens, and in charge of Chinchona Cultivation in *Bengal*, to the Secretary to the Government of Bengal (Botanic Gardens, 27th May 1869).

7. "The growth made by the plants in the Rungbee and Rishap plantations during the year has far exceeded that during the preceding year."

Enclosure in No. 20.

REPORT on the Number, Distribution, and Condition of Chinchona Plants on the Nilgiris for the half-year ending 31st January 1872.

Species.	Botanical Names.	Commercial Names.	Number of Plants.	Value per lb. of dry Bark in the London Market.
				s. d. s. d.
1	C. Succirubra - - - - -	Red bark - - -	1,215,963	2 6 to 8 9
2	C. Calisaya - - - - -	Yellow bark - - -	54,881	2 10 to 7 -
	C. „ Vera - - - - -			
	C. „ Frutex - - - - -			
3	C. Officinalis - - - - -	Original loxa bark -	1,183,159	2 10 to 7 -
	C. var Condamenia - - - - -			
	C. „ Bonplandiana - - - - -			
	C. „ Crispa - - - - -			
4	C. Lancifolia - - - - -	Pitayo bark - - -	279	1 8 to 2 10
5	C. Nitida - - - - -	Genuine grey bark -	2,786	1 8 to 2 9
6	C. Species without name - - - - -	Fine grey bark - - -	8,500	1 8 to 2 10
7	C. Micrantha - - - - -	Grey bark - - -	46,730	1 8 to 2 9
8	C. Peruviana - - - - -	Finest grey bark - -	3,389	1 8 to 2 10
9	C. Pahudiana - - - - -	Unknown - - -	425	Unknown.
10	C. Lanceolata-leaved variety of C. Officinalis.	- - -	6,319	- ditto.
11	C. Pitayo, raised from imported seeds	- - -	12,155	- ditto.
12	C. Pitayo plants brought out by Dr. Simpson.	- - -	76	- ditto.
Total number of plants - - -			2,626,526	

TABLE showing the Growth of the different Species of Plants planted out in the Plantations for the half-year ending 31st January 1872.

Number of Plants.	SPECIES.	Where planted.	When planted.	Maximum Growth.	Average Growth.	Height of the tallest Tree.	Girth near the Ground.
				inches.	inches.	feet.	inches.
12	C. Succirubra - -	Nedivuttum - -	30 Sept. 1862	11	7½	28½	27½
12	C. Micrantha - -	- ditto - -	30 „ „	12	5½	27½	31½
12	C. Officinalis - -	Dodabetta - -	30 „ 1863	39	18	22	16½

TABLE showing the Propagation, Distribution, &c., of Plants and Seeds during the half-year ending 31st January 1872.

DATE.	Total Number of Plants Propagated.	Total Plants permanently planted out.	Total Plants distributed to Private Individuals.	Total Quantity of Seeds gratuitously distributed.
August 1871 - - - - -	1,881	1,200	- - -	ozs. 8
September „ - - - - -	2,349	1,000	5,000	-
October „ - - - - -	1,708	- - -	- - -	14
November „ - - - - -	1,652	- - -	- - -	5
December „ - - - - -	1,507	- - -	- - -	-
January 1872 - - - - -	1,651	- - -	- - -	4
	10,748	2,200	5,000	31
Previously - - - - -	2,615,778	1,153,974	179,267	342
GRAND TOTAL - - -	2,626,526	1,156,174	184,267	373

Remarks.—1,500 Chinchona Calisaya and 700 C. Lanceolata plants were permanently planted out in the plantations at Neddivuttum, making the total 1,156,174.

Seven thousand eight hundred and sixteen C. Pitayo and 2,932 C. Lanceolata plants were propagated, making the total 2,626,526.

The number of plants distributed to private individuals is 5,000, making the total 184,267.

Thirty-one ounces of Chinchona seeds have been gratuitously distributed, making the total 373 ounces.

The circumference of the stems of the succirubra trees are given at a foot above the ground instead of at the surface, as in former reports.

Ootacamund, 7 February 1872.

—No. 21.—

(No. 11 Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Duke,

Fort St. George, 7 March 1872.

In continuation of our Despatch, dated 21st August 1871, No. 36, Miscellaneous, we have the honour to advise your Grace of the transmission to the India Office by steamer, *via* the Suez Canal, of 12 cases received from the Commissioner of the Nilgiris, containing 4,106 lbs. of Chinchona bark for sale in the English market.

2. The Commissioner's letter on the subject, with its enclosure, and one from the Government Quinologist, reporting the results of the analysis of the bark in question, are herewith forwarded.

We have, &c.,

(signed) A. J. Arbuthnot.

Enclosure 1, in No. 21.

From the Government Quinologist, to the Officiating Chief Secretary to Government, Fort St. George, dated Ootacamund, 26th February 1872:—

A considerable amount (4,106 lbs.) of red and crown bark is being sent to England for sale by the Superintendent of the Chinchona Plantations according to the following invoice:—

No. of Boxes.	Description of Bark.	Weight of		Total Weight.
		Bark.	Boxes.	
		<i>lbs.</i>	<i>lbs.</i>	
1	Red Bark, Mossed	182	55	
2	" "	190	61	
3	" "	252	84	
4	" "	229	73	
5	" "	326	90	
6	" "	116	41	
7	Crown Bark "	430	108	
8	" "	400	103	
9	" "	658	139	
10	" "	368	84	
11	" "	676	145	
12	Red Bark, Unmossed	279	59	
TOTAL		4,106	1,062	5,148

2. The barks on an average contain 10 per cent. of water, although air-dried bark. The amount of alkaloid contained in the average specimen of each bark is as follows when expressed in percentages of quite dry bark :—

	Crown Bark.	Unmossed Red Bark.	Mossed Red Bark.
Total Alkaloids	4.02	6.60	7.80
Quinine	2.43	1.49	1.64
Chinchonidine and Chinchonine	1.59	5.11	6.16
Pure Sulphate of Quinine obtained crystallized	2.43	0.84	0.92
Other Sulphates obtained crystallized	1.10	4.45	4.74

3. The mossed red bark is from the oldest trees and has been long under moss. The unmossed red bark is from the upper part of the trunks of some trees. The crown bark is from the Neddivuttum plantations, and consequently though good not of our best quality.

Enclosure 2, in No. 21.

From the Commissioner of the Nilgiris, to the Officiating Chief Secretary to Government, Fort St. George, dated Ootacamund, 1st March 1872.

With reference to Order of Government, Revenue Department, No. 2,048, dated 5th December 1871, I have the honour to forward, herewith, a letter from Mr. McIvor, with its Enclosure, No. 148, dated 29th ultimo, advising despatch to Madras, through the Carrying Company, of 12 boxes, containing Cinchona bark.

2. I beg to invite your attention to paragraph 3 of the above letter, regarding protection of the boxes from salt water, while in transit from the beach to the shipping.

From the Superintendent, Government Cinchona Plantations, to the Commissioner of the Nilgiris, dated Ootacamund, 29th February 1872.

I have the honour to enclose the Madras Carrying Company's receipt for 12 boxes, containing Cinchona bark, forwarded to the Revenue Secretary to Government, Madras, for the Secretary of State for India, in accordance with Government Order, No. 1,339, dated 4th August 1871, and Government Order, No. 2,048, dated 5th December 1871.

2. The boxes contain 1,295 lbs. of Mossed Red Bark.

279 „ of Unmossed „
2,532 „ of Crown Bark, as noted at foot.

3. I beg you will be good enough to request that the boxes may be protected from salt water while conveying them from the beach to the ship.

— No. 22. —

(No. 18—Revenue.)

From the Secretary of State for India to the Government of Madras.

My Lord,

India Office, London, 9 May 1872.

I HEREWITH transmit five copies of a work entitled "*Nouvelles Études sur les Quinquinas, &c., par J. Triana*," for presentation to public libraries, and for the use of officers who are in charge of, or connected with Chinchona cultivation in the Madras Presidency.

I have, &c.,
(signed) *Argyll.*

— No. 23. —

(No. 21—Revenue.)

From the Government of Madras to the Secretary of State for India, Fort St. George, 4 June 1872.

My Lord Duke,

WITH reference to paragraph 2 of Sir Stafford Northcote's Despatch, dated 30th November 1868, No. 47, we have the honour to forward, for your Grace's information, our proceedings marginally noted, containing a letter from the Government Quinologist, reporting the results obtained by the action of certain manures on Chinchonas.

2. Mr. Broughton's experiments in the matter are very instructive and important; and it seems desirable that they should, as proposed by him, be continued on an extended scale. We accordingly enclose an indent for the English manures required for the plantations, namely, one ton of sulphate of ammonia and one ton of Peruvian guano, and request that your Grace will cause the same to be supplied to us as early as practicable.

3. It will be seen that we have arranged for ordinary farmyard manure having also a trial.

We have, &c.,
(signed) *Hobart, &c.*

Enclosure 1 in No. 23.

From the Government Quinologist, Ootacamund, to the Officiating Chief Secretary to Government, Fort St. George, dated 7 March 1872.

I HAVE the honour, in the following pages, to communicate the results at present obtained by the action of certain manures on the trees of *Chinchona succirubra* and *officinalis*, growing on the Government plantations.

2. The Government, in consequence of my suggestion,* ordered that experiments should be tried with certain nitrogenous artificial manures, in order to determine whether their action would increase the amount of alkaloid in the bark of the Chinchona trees to which they were applied.

3. In consequence, 10 casks of manures were ordered from England, consisting of 12 cwt. of ammoniac sulphate, as prepared from English "gas-liquor," and 9 cwt. of "Peruvian guano," both being of good commercial quality. These manures were applied to several plots of trees at the Dodabet and Neddivuttum plantations in October 1869, the trees being of various ages, and the quantities applied varying from 4 oz. to 1 lb.

4. Some

Proceedings of
Government, 10
April 1872.
Proceedings of
Government,
1 June 1872.

Origin and objects
of experiments with
manures.

* Government
Order, Revenue
Department, 22
September 1868.

Proceedings.

4. Some fine young plants of *C. Succirubra* at Neddivuttum, three years of age, were treated in November 1869 in plots of 50 each, with 1 lb. of ammonic sulphate and the same amount of guano. There were but few showers after October, and no surprise was felt at the circumstance that the trees did not in the least differ in appearance from the ordinary unmanured trees. But after the succeeding south-west monsoon, it appeared somewhat strange that no greater luxuriance of growth was apparent. The trees, even during the rains of 1871, preserved still their ordinary appearance, and I thought it remarkable that these ordinarily stimulating manures should so entirely fail in their effect on the Chinchona trees. It was not until the autumn of 1871 that any change was perceptible; but at that time it appeared to me that an increase in the depth of tint of the leaves and a somewhat greater luxuriance was apparent among the trees, manured with ammonic sulphate. The difference, however, was slight, and I was informed by Mr. McIvor that no difference was perceptible to him. I certainly perceived no change in the growth whatever in those trees which had received less than 1 lb. of the manure.

Proceedings and consequences with *C. Succirubra*.

5. In January last, the time appeared to have arrived at which it was desirable to examine analytically the quality of the barks. The following statement gives the amounts of alkaloid obtained, calculated in per-centages of dry bark; compared with a sample of bark taken from trees of same age, growing near, under conditions which only differed by the absence of manure.

Results with ammonic sulphate.

	Manured.	Unmanured.
Total alkaloids - - - - -	7.25	4.89
Quinine - - - - -	2.45	1.78
Chinchonidine and Chinchonine - - -	4.80	3.11

I thus found, somewhat to my surprise, that the manure had caused an increase in the alkaloids to the amount 2.36 per cent., of which 0.67 consisted of quinine.

6. A similar examination was conducted with the trunk bark of the trees which had received 1 lb. of guano. The comparative results are expressed in the same manner as the above:—

Results with Guano.

	Manured.	Unmanured.
Total alkaloids - - - - -	5.29	4.76
Quinine - - - - -	0.91	1.04
Chinchonidine - - - - -	4.38	3.72

7. From these analyses it is evident that the guano had produced an increase of but 0.53 per cent. of total alkaloids, and that the manured bark contained 0.13 per cent. less quinine than the unmanured. The loss of guano, when compared with that of ammonic sulphate, is contrary to what would be expected *a priori*. The conclusion I derive from these experiments with *C. Succirubra* is, that as the gain in the most successful case consists mainly of alkaloids other than quinine, it will not be profitable henceforward to manure this species, even with ammonic sulphate, as the cost of such manure may be as great as the increase in the commercial value of the bark. The fact of the gain in alkaloids is, however, a result of much interest.

Consequences.

8. I have had occasion in the report noted in the margin and in many subsequent reports to mention the great sensitiveness with which the crown bark trees are effected by situation, sunlight, and character of soil; and have taken the opportunity of expressing my conviction that *C. officinalis* was the best adapted for high cultivation. Hence I naturally anticipated that the influence of manures on this species would be marked, and would result in a considerable increase in the amount of alkaloids contained in the bark. The considerable variations which occur in the bark of this species from apparently slight causes necessitated much care in experiments in which the influence of manures was to be investigated. Hence in an apparently homogeneous plot of *C. officinalis* long double rows were selected in which to try the effect of the manures, while the trees between these double rows were left unmanured.

Proceedings, Madras Government, 22 February 1870, No. 235, paragraphs 5 and 6. Sensitiveness of *C. officinalis*.

9. In October 1869 the manure was applied in amounts of 1 lb. and $\frac{1}{2}$ lb. of each to a tree. Smaller amounts were also used, but were applied to younger trees. The trees to which the larger quantities of manures were applied were of the same age as the trees of *C. Succirubra*.

Proceedings and consequences with *C. officinalis*.

C. succirubra at Neddivuttum, or were, in 1869, of three years old. Several heavy showers fell after the manuring took place, and it was with much surprise that I could perceive no change had taken place in the growth of the tree. Since the above date no improvement whatever has been perceptible in the manured trees over the immediately adjoining trees which have been unmanured. As the trees of *C. officinalis*, which yield the finer barks, are nearly always of more vigorous and luxuriant growth, I for a long time concluded that the views I formerly held were wrong, and that the experiments with manures would yield negative results only. In February 1872 no difference was to be distinguished between the manured and unmanured trees, and they were only to be recognised by the postal labels which marked them. The trees which had received 1 lb. of guano gave the following per-centages of alkaloid in the dry bark. The analysis of the unmanured bark is also attached for comparison, a mean specimen of each being carefully collected for that purpose:—

Results with guano.

	Manured.	Unmanured.
Total alkaloids - - - - -	6.51	3.98
Pure Quinine - - - - -	4.41	2.40
Chinchonidine and Chinchonine - - - -	2.10	1.58

Hence it appears that the 1 lb. of guano had increased the total alkaloids in the bark by 2.53 per cent., of which increase 2.01 was quinine.

Results with ammonic sulphate.

10. It was with great vexation that I found that the stake, which carried the label which marked the trees that had received the 1 lb. of ammonic sulphate, had been taken away during the last three months of 1871, and that no mark remained by which the trees could be distinguished. Hence, to ascertain the effect of this ammonic salt, I had to take trees which had received but $\frac{3}{4}$ lb. of the manure. The content of the dry trunk-bark in alkaloids is expressed as follows:—

	Manured.	Unmanured.
Total alkaloids - - - - -	5.76	4.54
Pure Quinine - - - - -	3.11	2.54
Chinchonidine and Chinchonine - - - -	2.65	2.00

The addition as manure of $\frac{3}{4}$ lb. of ammonic sulphate had thus produced an increase of 1.22 of total alkaloids, and 0.57 of quinine.

Application of farm-yard manure.

11. In 1857, during the absence of the Superintendent of the plantations in England, I requested the acting superintendent, Mr. Batcock, to apply stable manure to six average trees of *C. officinalis*. On the return of the Superintendent, Mr. McIvor continued the application of a barrow load of pig-litter or bullock manure every six months, as commenced by Mr. Batcock. More lately, owing doubtless to the frequent changes made in the subordinate superintendence of the plantations, this manuring has been carried out with great irregularity. On the whole, each tree has probably had three applications, and at the most but four. As no improvement was perceptible in the appearance of the trees, none has been applied during the last 18 months. In February 1872 specimens of bark have been taken from four trees, and at the same time the bark was taken from several unmanured trees growing under the same conditions and immediately adjoining. The analyses are as follow:—

	Manured.	Unmanured.
Total alkaloids - - - - -	7.49	4.68
Pure Quinine - - - - -	7.15	2.40
Chinchonidine and Chinchonine - - - -	0.34	2.28

Hence there has been a singular improvement in the quality of the bark. The total increase in alkaloids has been 2.81 per cent., but the manure has also had the singular effect in causing the alkaloids to be quinine, instead of cinchonidine and cinchonine. Hence

Hence the total increase in pure quinine is no less than 4·75 per cent. Hence the bark has been at least doubled in value in the English market, and the gain or difference in value in English money may be estimated at the present time to be 2 s. 6 d. per pound of trunk-bark. This estimate does not take into account the fact that this manured bark yields quinine sulphate sufficiently pure without the cost of the separation from the cinchonidine sulphate; and hence is of less expense in quinine manufacture.

Results and gain.

12. In nearly every case in which the action of farm-yard manure has been compared with the more artificial manures, it has been found to have somewhat the superiority. Although in the above experiments it has had the advantage of a longer time of action, this superiority still is evident.

General superiority of farm-yard manure.

13. The only perceptible change which appears in the crown bark trees by these nitrogenous manures consists in the increased yield of alkaloids. There is no greater luxuriance of growth apparent, and it is only by analysis that a change is detectable in the bark. This result appears to me strongly to corroborate the hypothesis that it is by supplying the elements of the alkaloids in an appropriate form that the increased yield is produced. I have long been of opinion that the alkaloids in the bark of the trees are not specially active constituents in the processes connected with the life and growth of the plant, and this supposition is supported by the circumstance that the increased amount of alkaloid produced by the manure causes no change in the appearance and rate of growth of the tree.* It is thus to be remarked that the action of manures on Chinchona is peculiar and specially supports the above hypothesis. It would be quite intelligible from the well-known action of manures upon growing plants that an increased growth of bark would be obtained. But this is not the result with Chinchona; a larger yield is not obtained; but certain constituents of the bark are increased in quantity. That there is a certain similarity in composition between some constituents of the manure and the alkaloids appears thus a fair conclusion.

Corroboration of hypothesis formerly mentioned.

14. The addition as manure of 1 lb. of guano to a tree of *C. officinalis*, as reported above, has caused an increase in the value of a pound of bark that may be moderately estimated at the present time to increase its market value by 1 s. 6 d. per lb. The cost of the guano bought in England, with that of freight, insurance, agent's commission, and carriage to the hills, cost 2½ d. per lb. It thus is evident that even employing guano, obtained at by no means the lowest cost, as manure to *C. officinalis*, the profit is certain and considerable. It is furthermore probable that the maximum effect of the manure has not been arrived at in the foregoing experiments, since it is unlikely that the period of greatest yield would be hit upon by chance in the first trial.

Discussion of gain.

15. It thus appears to me that the action of manures promises a new direction in which the cultivation of the Chinchona alkaloids can be still further improved.

16. I should mention that the quinine obtained from the manured trees readily yields its normal, or nearly theoretical amount of crystallized sulphate. As the analyses were not made for a commercial purpose, the amount of crystalline sulphates has not in every case been determined.

Quinine readily crystallizes as sulphate.

17. There are some plots of younger trees whose treatment with manure has hitherto purposely been in smaller amount than those whose examination forms the subject of the foregoing. I am of opinion that a further small quantity of manure should be obtained from England for the further treatment of these young trees and for certain experiments suggested by the foregoing. The manure can be procured out of savings in my next year's budget. Whether the application of manures should be carried out to a greater extent than these experimental plots Government will decide. I would recommend that *C. officinalis* be the species to which it should be applied; and that if stable manure, as is probable, cannot be obtained in sufficient quantity, guano should be the manure used.

Projected proceedings.

ORDER of Madras Government thereon, 10 April 1872.

IN this letter the Government quinologist reports the results obtained by the action of certain manures on Chinchonas.

2. Mr. Broughton's experiments in the matter are very instructive and important; and it seems desirable that they should, as proposed by him (paragraph 17), be continued on an extended scale. The Government will be prepared to apply to the Secretary of State for a supply of the English manures on being furnished with an indent of the quantity required. They think it will be well that the indent should provide for double the quantity stated in paragraph 3 of the report to have been obtained in 1869, so as to admit of the experiments being made under greater diversity of circumstances. Ordinary farm-yard manure should also have a competitive trial; cattle and pigs being purchased to form this manure if it is not otherwise procurable. The Commissioner of the Nilgiris will instruct Mr. McIvor to arrange for having this done.

* Mr. McIvor informs me that he has greatly stimulated the growth of young plants on poor soil by manuring them with cow-dung. No stimulus was, however, as has been stated, apparent in the cases to which this report refers.

— No. 24. —

(No. 28—Revenue.)

From the Secretary of State for India to the Government of Madras.

My Lord,

India Office, London, 8 August 1872.

1. I HAVE received and considered in Council your Excellency's Despatches, dated February 29th (No. 7), March 7th (No. 11), and June 11th (No. 21), 1872, on the subject of Chinchona cultivation.

2. With reference to the cases of Chinchona bark, the transmission of which was announced in your Despatch of the 7th of March (No. 11), I have now to inform you that the *C. officinalis* bark was sold direct to Messrs. Howard at 2 s. 4 d. the lb., and that the red bark, in the open market, fetched prices from 3 s. 1 d. to 2 s. 1 d. the lb. The amount, 429 l. 13 s. 5 d., will be placed to the credit of Revenue in the Home Account. Messrs. Howard, after receiving the analysis, were only able to offer 2 s. 4 d. per lb. for the *C. officinalis* kind. Yet I have been given to understand that *C. officinalis* bark, on a private plantation in the Nilgiris, growing under the same conditions, has been sold at 3 s. 6 d. per lb. There can be no reason why the Government bark should not be as good as that grown, under the same conditions, by private speculators, and I desire that the Commissioner of the Nilgiris may be instructed to make inquiries on the subject. The chief object of your Government, in forwarding bark for sale in the London market, should be to make its great superiority over all other barks well known throughout the world, and care should therefore be taken that it is equal to any bark that is grown, under the same conditions, on private plantations.

3. The experimental application of manure to Chinchona trees has been attended with interesting and important results, and I have given order for the prompt supply of the manure for which you have indented.

I have, &c.
(signed) Argyll.

— No. 25. —

(No. 28—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Duke,

Ootacamund, 13 September 1872.

WE have the honour to forward the Reports on the Government Chinchona Plantations on the Nilgiris for the years 1870-71 and 1871-72, together with our Proceedings thereon, dated 15th March and 20th August 1872, Nos. 456 and 1,237. The information conveyed by the former Report will have already reached your Grace in the Administration Report for the year.

2. The G. O. of 8th June 1871, No. 1011, quoted in paragraph 3 of our Proceedings of 20th August 1872, is forwarded.

We have, &c.
(signed) Hobart, &c.

Proceedings of
Government, 15th
March 1872, Nos.
182, 183.
Proceedings of
Government, 20th
August 1872, Nos.
184, 185.
Proceedings of
Government, 8th
June 1871, Nos.
84-86.

Enclosure 1, in No. 25.

From the Commissioner of the Nilgiris, to the Secretary to Government, Revenue Department, Fort St. George; dated Ootacamund, 9th June 1871.

I HAVE the honour to submit the report on the Government Chinchona plantations for 1870-71.

2. Two acres of the new varieties of *C. Calisaya* were planted during the year, and this was the only extension made. The other planting operations were confined to filling up vacancies, planting the edges of roads and spaces by the side of ravines. 602 plants and 45 oz. of seeds were distributed to the public; 51,352 lbs. of fresh bark were supplied to the Government Quinologist for the manufacture of his "amorphous quinine."

3. The Superintendent reports that the trees manured with guano, sulphate of ammonia, and stable manure in 1870, have not yet shown any marked improvement in growth.

4. The Superintendent's calculation of the yield in the eighth year of an acre of Chinchona holds out a favourable prospect to Chinchona growers on the Nilgiris. There is, however, much force in his remarks on the length of time the grower has to wait for a return for his outlay; eight or nine years with red barks, and 12 or 14 with crown barks. This seems to me to tell with great force in favour of the cowle-system of land tenure, if Government are desirous to see their waste land taken up for Chinchona cultivation. In connection with this I take leave to refer to my letter to the Board, dated 26th October 1869, No. 149.

5. I need not here discuss the mossing and coppicing processes alluded to in paragraphs 10, 11, 12, 13, and 14 of Mr. McIvor's report. As stated in my letter of the 15th March last, No. 20, the value of mossed as compared with unmossed barks, and the best mode of harvesting the bark, are now being tested.

6. During the year under review Mr. McIvor, with the sanction of Government, paid a visit to the Bengal plantations, and has submitted an interesting report on their condition. I would suggest here that he be permitted in like manner to pay a visit to the Java plantations at a time of year when his services can be spared, in order to make himself acquainted with the system of Chinchona cultivation in force, and the result obtained there.

7. I have visited the various Nilgiri plantations several times in the year under report, and am well pleased with all I have seen, except at Mailkoondah, regarding which plantation the Government are in possession of my opinion. I regret that Mr. Dawson has left the department; his practical knowledge of the state of our plantations, and of the various experiments that were being carried on rendered his services of especial value in the absence of Mr. McIvor.

8. In the course of a month or so, I hope to be able to submit to Government detailed survey plans of all the Government Chinchona estates.

REPORT on the Government Chinchona Plantations, Ootacamund, Nilgiris, for the Official Year 1870-71.

THE growth of the Chinchona plants during the past year has been very satisfactory. The older plants of the different varieties of *C. officinalis* have formed fine leading shoots, and entirely thrown off the shrubby habit, and assumed a tree-like appearance. The largest plants of *C. officinalis* vary from 22 to 23 feet in height, with a circumference of stem of from 18 to 21 inches. The finest plants of *C. Succirubra* are now 30 feet high, with a circumference of stem of 3 feet.

2. Three thousand five hundred plants of the new varieties of *C. Calisaya* have been permanently planted out on new land. These have been planted close, and will cover about two acres of land. This is the only extension made to our permanent plantations, our operations having been confined to filling up failures, planting along the edges of the roads and spaces by the sides of ravines.

3. The number of plants of the new species propagated during the year is 16,379 against 17,000, the result of last year's propagation. Only 662 plants have been distributed to the public, and 45 ounces of seed have been gratuitously issued to planters in various parts of India.

4. Among the new species recently introduced, some of the varieties of Pitayo bark
279.

Plants grown well.

C. officinalis assumed a tree-like habit, and assumed a tree-like appearance. Size of largest trees. Red bark plants 30 ft. high, with stem 3 feet in circumference.

Two acres added to permanent plantations.

Plants propagated. Plants and seeds distributed.

Increase of new and rare species.

promise to be hardy and well suited to this climate. The total number of plants of new and recently introduced varieties are as follows :—

<i>Chinchona lancifolia</i> (from Java) - - - - -	279
" <i>officinalis</i> (lanceolate-leaved variety) - - - - -	2,140
" <i>Pitayensis</i> - - - - -	1,779
" <i>Calisaya</i> new varieties - - - - -	54,881
	<hr/> 59,079 <hr/>

Calisaya yellow barks.

Pitayo barks.

C. lancifolia.

Lanceolate-leaved variety of *C. officinalis*.

Bark supplied for the manufacture of amorphous quinine. Effect of manure on Chinchona trees.

Collection of bark from mossed trees.

Yield and value per acre.

Increase of value with growth of plants.

Impression that Chinchona cultivation will not pay.

Money withdrawn and plantations neglected.

Yield of bark from eight-year old trees in Government plantations higher than could be obtained from private plantations.

Difficulties encountered by speculators in Chinchona cultivation.

The growth of American bark costs nothing.

In India production of bark forms a heavy charge.

Supply of bark from America abundant.

High quality of bark required to compete successfully with American bark.

Advantages of mossing process.

5. The new varieties of *C. Calisaya* having been sufficiently propagated to meet the extensions desired by Government, the propagation of these sorts has been discontinued. The important plants *C. Pitayensis*, received on the 6th December 1870, are being increased, as this imported variety is stated by Mr. Cross to be of very great value, and it may differ in quality from the seedlings raised from the imported seeds; it is, therefore, considered desirable to continue the propagation of this kind. The *C. lancifolia*, received from Java, makes slow growth in this climate, and consequently has not been extensively propagated. There are in all seven varieties of the lanceolate-leaved *Chinchona officinalis*. These differ slightly in appearance one from another, and also in the quality of bark. Nos. 1 to 3 having been found to yield the greatest quantity of quinine, these numbers only are now propagated.

6. During the year 51,352 lbs. of fresh bark has been supplied to Mr. Broughton, the Government Quinologist, for the manufacture of amorphous quinine.

7. The Chinchona trees which were manured in 1870, with guano, sulphate of ammonia, and stable manure, do not show any marked difference in their growth, and probably the manure will have little or no effect upon the secretion of the alkaloids.

8. The bark is now being taken from the 4,000 plants of *C. Succirubra*, and 2,000 of *C. officinalis* (Condamenia), which were mossed during last year, in order "to test the value of my mossing process when applied on a large scale." The results will hereafter be reported in a separate communication. I would, however, observe that from 1,000 unselected eight-year old plants of *C. Succirubra*, 1,060 lbs. weight of dry bark has been taken; these plants will yield in October and November of this year 1,500 lbs. more of dry bark; in all 2,560 lbs. during the year, or an average of over 2½ lbs. of bark per tree. This bark will realise in the home-market from 2 s. 8 d. to 3 s. per lb., from which, deducting 8 d. per lb. as cost of collection, carriage, &c., and calculating 350 trees to the acre, a clear profit of at least 1 rupee per lb., or 875 rupees per acre will remain. Supposing the cost of Chinchona cultivation at the eighth year to be 1,000 rupees per acre, the above return will make Chinchona cultivation a very good investment, especially as the yield in the ninth year will be almost equal in value to that obtained in the eighth. In the tenth and each succeeding year, the yield will, in all probability, increase with the growth of the trees, and in consequence of the quality of the bark improving with each renewal. I make the above observations, as at the present moment, there is a strong conviction that Chinchona cultivation will not prove profitable. This conviction has caused private individuals, who have invested in the cultivation as a speculation, to withhold expenditure; consequently, private estates on the Nilgiris are generally in a neglected or abandoned condition.

9. The above yield of bark is higher than could be expected from the average of private plantations in the eighth year. Such plantations would probably not yield more than half the quantity of bark given above, as the trees from which this bark was taken, were planted in October 1862, on the Government plantations, and from the first were well cared for. The land was thoroughly prepared and trenched before the plants were placed in it, and from that time to the present date the plants had every attention and care; consequently, their growth has been much above the average development of trees on private plantations, where a smaller expenditure of money and care has been considered sufficient.

10. There exists, however, serious difficulties to be encountered by speculators in Chinchona cultivation. With red bark, it is necessary to wait eight to nine years, and with crown bark 12 to 14 years, before a profitable crop can be obtained. It is few who can be so long out of their money, and at the same time maintain an expensive cultivation. Apart from this, it is difficult to enter into successful competition with American-grown bark. In America, chinchona bark is a wild product, and its growth costs nothing. Here, in India, as a cultivated plant, the cost of production forms the heaviest item of charge. From the quantity of bark brought into the home-market, it appears that the supply from America, instead of decreasing as was anticipated, is yearly becoming more abundant, so that the supply from this source keeps pace with the increasing demand. It is therefore evident that, with a low quality of bark, we can never hope successfully to compete in the home-market with American bark of like quality; but with higher quality barks, I believe that a successful and profitable competition can be established. The mossing process is indispensable to obtain a bark of high quality, as by each successive renewal of bark its value increases; and this will, no doubt, continue until red bark will yield from 10 to 12 per cent. of crystallizable alkaloids, and of this from 6 to 8 per cent. of quinine sufficiently

sufficiently pure to pass the commercial tests. From crown barks, a like quantity of crystallizable alkaloids will probably be procured; of which, from 8 to 10 per cent. will be commercial quinine. Bark of this quality would defy competition, as no such bark could be procured from America. The freedom with which these high qualities of bark are worked, greatly enhances their value, while the cost of collection, preparation, and shipment, would be the same as for an inferior bark. It appears, therefore, to be an object of importance to aim at producing only the highest quality of bark.

11. The bark from loppings and prunings, such as we have during last year supplied to Mr. Broughton for the manufacture of amorphous quinine, if sent into the London market, would scarcely pay the cost of collection and carriage. The coppicing-system has the disadvantage of always producing a bark of ordinary quality, and only giving a crop every eighth year.

Bark from small branches would not pay cost of collection and carriage. Coppicing system.

12. In Mr. Broughton's letter of the 31st August 1870, recorded in Proceedings of Government of the 7th February 1871, that gentleman estimates the yield of an unmossed tree at eight years of age to contain 7.55 per cent.* of alkaloids in the trunk bark and 3.2 per cent. in the branch bark, or an average of 5.375 per cent. Mr. Broughton does not say how much of this is crystallizable, or how much is quinine. When the bark is to be sold, this would be important, although it is not so when the bark is made into "amorphous quinine." In paragraph 11, Mr. Broughton says, "I assume that after a tree, aged eight years, has been cut down, that the shoots, after a lapse of eight years, will produce as much bark as the original tree; an assumption that will not, under any circumstances, entail a great error." In Appendix at paragraph 1, the yield of dry bark from a tree of eight years' growth is given at a little less than 1 lb. 5 oz. of dry trunk bark, worth from 2 s. 8 d. to 3 s. per lb., in the home-market, and 1 lb. 6 oz. of branch bark, worth from 1 s. to 1 s. 4 d. per lb., or a total value of Rs. 2. 10. per tree. These trees being cut down every eight years will entail the cost of keeping the land clean, otherwise weeds will spring up and choke the young shoots. This would cause considerable additional expense, perhaps equal to that of mossaing and removing the bark annually from mossed trees. The commercial value of Chinchona depends on the quantity of crystallizable sulphates it contains, not on the total alkaloids.

Quantity of bark and estimation of value from unmossed trees.

13. Mr. Howard found the first crop of renewed red bark of one year and five months' growth from a plant of three years and five months old, to give 5 per cent. of crystallized sulphates and 7.70 per cent. of total alkaloids.† The second crop of renewed bark of 17½ months' growth gave of crystallizable sulphates 8.45 per cent., and total alkaloids 9.79 per cent.‡ The application of moss to red bark trees does not act materially till after 12 or 14 months in increasing the crystallizable alkaloids. In the red barks it is between the 12th and the 18th month of the growth of the bark that the crystallizable alkaloids rapidly increases; therefore a harvest of bark of high value can only be obtained from mossed trees of this species every 18 months, namely, one-half of the bark being taken in May and the other half in October in each succeeding year; these being the best seasons for the removal of mossed bark.

Quality and yield of renewed mossed bark.

Crystallizable alkaloids increase with each renewal of bark, and are greatest in bark of eighteen months' growth.

14. The total quantity of alkaloids in mossed bark is as great at 12 months' growth as at 18, and for the manufacture of "amorphous quinine" the harvest of bark could be obtained annually, thus Mr. Howard, in the first renewal of bark of one year's growth from a plant of three years and five months old, found of crystallizable sulphates 2.72 per cent., of alkaloids soluble in alcohol 7.00 per cent., or a total of 9.72 per cent.§ of alkaloids. The third harvest of renewed bark of 12 months' growth from a tree of seven years old gave 6.15 per cent. of salts of quinine and 11.20 per cent. of total alkaloids.|| From the above results it appears that the total alkaloids are greatest about the twelfth month, and increase with each renewal of bark, and that the crystallizable alkaloids reach their maximum about the 18th month of the growth of the bark; but to fix this definitely, and to insure the bark being taken at the best time for the preparation of crystallizable sulphates and for amorphous quinine, a few further experiments are necessary.

Total alkaloids greatest in renewed bark of twelve months' growth.

15. The high system of cultivation hitherto maintained on our plantations has not been carried out during the past year, the expenses having been reduced to the lowest point possible. The result, however, of last year's cultivation makes it evident that, to secure the greatest possible benefit from our chinchona plantations, it is necessary and economical to maintain a liberal system of cultivation.

Cultivation.

16. The establishment in the Chinchona Department has been very materially reduced. Mr Jamieson, the deputy superintendent, was removed at the end of the year from the department

Establishment.

* Appendix, paragraph 1.

† Report of an analysis of the fourth remittance of the bark from India, by J. E. Howard, Esq., F.L.S., to the Under Secretary of State for India, 1st August 1865.

‡ Report of an analysis of the fifth remittance of bark from India, by J. E. Howard, Esq., F.L.S., to the Under Secretary of State for India, 4th February 1867.

§ Report of an analysis of the fourth remittance of bark from India, by J. E. Howard, Esq., F.L.S., to the Under Secretary of State for India, 1st August 1865.

|| Report of an analysis of the eighth remittance of bark from India, by J. E. Howard, Esq., F.L.S., to the Under Secretary of State for India, 1st September 1868.

department, and placed in sole charge of the Botanical Gardens. Mr. Dawson, the assistant superintendent of Neddivuttum Plantation, has left the department and accepted employment in the Ouchterloney Valley.

Buildings. 17. No new buildings have been erected during the year, the principal work performed being weeding the plantations, maintaining roads, cutting drains, and filling up failures.

Tea plantation. 18. The tea plantation has not been further extended, and a considerable number of the rooted tea cuttings in the nursery at the end of autumn died during the last dry weather.

European fish. 19. The acclimatization of the European fresh-water fish, introduced in December 1867, has proved most successful. The trout, rudd, carp, tench, gold and silver fish are increasing rapidly. The tench, especially, are most prolific, and grow to a large size in one year; a dozen of these fish bred here were caught, and weighed from $1\frac{1}{2}$ to 2 lbs. each.

20. Appended are the meteorological tables, and table of expenditure from 1860 to 31st March 1871.

Ootacamund, 31 May 1871. (signed) *W. G. McIvor*,
Supt., Government Chinchona Plantations.

METEOROLOGICAL OBSERVATIONS, from 1st April 1870 to 31st March 1871, made on the Government Chinchona Plantations at *Neddivuttum*.

MONTHS.	DRY BULB.				WET BULB.				Minimum ob- served during the month.	RAINFALL.		Days with Rain.	Days without Rain.	
	7 A.M.	2 P.M.	6 P.M.	Daily Mean.	7 A.M.	2 P.M.	6 P.M.	Daily Mean.		Inches.	Cents.			
April 1870	-	60.90	79.53	67.53	69.32	56.90	64.56	60.96	60.80	54.00	-	89	2	28
May "	-	60.45	74.71	61.20	65.45	57.96	65.42	58.64	60.67	54.40	2	86	7	24
June "	-	60.33	60.33	61.00	60.55	60.33	60.00	61.06	60.46	56.00	22	73	28	2
July "	-	55.13	57.10	57.26	56.50	56.00	57.32	57.26	56.86	55.03	29	86	26	5
Aug. "	-	56.32	57.48	57.06	56.95	56.13	56.81	56.32	56.42	55.61	25	24	23	8
Sept. "	-	55.86	56.33	56.13	56.11	55.83	56.13	55.96	55.97	55.40	22	39	23	7
Oct. "	-	57.19	59.36	60.93	59.16	57.16	59.10	59.10	55.12	56.77	19	44	23	8
Nov. "	-	56.27	70.23	56.80	61.10	54.13	61.43	52.50	56.02	47.23	2	67	7	23
Dec. "	-	58.55	72.16	67.16	65.96	55.39	54.71	53.71	54.60	49.61	-	39	2	29
Jan. 1871	-	65.64	70.84	65.77	63.75	67.41	65.36	64.55	65.94	56.06	-	35	1	30
Feb. "	-	65.68	68.18	61.54	65.13	61.43	67.11	64.71	64.42	55.46	-	65	3	25
March "	-	64.65	79.90	70.16	71.57	51.25	75.87	53.03	60.05	53.68	-	74	3	28
TOTAL - - -	-	-	-	-	-	-	-	-	-	-	128	21	148	217
Annual Mean -	-	59.75	67.18	61.88	62.63	57.48	61.98	58.15	58.94	54.10	-	-	-	-

Ootacamund, 1 April 1871.

W. G. McIvor,
Supt., Government Chinchona Plantations.

ORDER of the Madras Government thereon, 15th March 1872.

THE above paper has been in great measure incorporated in the General Administration Report for the Presidency. The Government will briefly note the leading points in it. During the year 1870-71 the Superintendent of the Government Chinchona Plantations and his staff were principally occupied with the conservancy of the existing plantations, which require a moderate annual outlay in clearing and weeding, &c. The only extension made was on the Dodabetta Estate, where three thousand five hundred plants of the new varieties of *C. Calisaya* were planted out on two acres of fresh land.

2. The total expenditure of the year appears, from the tabular statement in the Appendix, to have been Rs. 29,490, against Rs. 45,106 in 1869-70, in which year considerable additions were made to the plantations. The largest share of expenditure was incurred at Neddivuttum.

3. All the plantations, except that at Mailkoondah, are in a thriving condition. The older plants of the *C. Officinalis* variety have assumed a tree-like form, and some of the finer plants of *C. Succirubra* are 30 feet high, with a circumference of stem of from 18 to 21 inches.

4. During the year 51,352 lbs. of fresh bark were supplied to Mr. Broughton. The bark is now being taken from the plants which were subjected to the mossing process, in order to test the value of that experiment.

5. A large portion of the Report is devoted to an examination of the worth of chinchona-planting as an investment of private capital. The conclusion drawn by Mr. McIvor is, that although Indian-grown bark competes under great disadvantages in the market with the indigenous American bark, success may be reasonably looked for in the cultivation of chinchona in this country, if it is confined to the growth of the barks of higher quality.

Enclosure 2, in No. 25.

From the Commissioner of the Nilgiris to the Chief Secretary to Government,
Ootacamund; dated Ootacamund, 12th July 1872.

I HAVE the honour to submit Mr. McIvor's report on the administration of the Chinchona Department during the official year 1871-72.

2. It is stated that the plantations have thriven during the year, notwithstanding drought in the months of January, February, and March last.

3. Of the new varieties of chinchona, 900 of the *Pitayensis*, 1,000 of the *Lanceolata* (*C. Angustifolia*), and 2,750 of the *C. Calisaya*, have been planted out on the Dodabetta and Hooker plantations; 12,213 of *C. Pitayensis* and 4,124 of *C. Angustifolia* have been propagated, and 5,000 plants have been distributed to the public, and 44 ounces of seed.

4. Mr. McIvor contemplates planting five acres of each of the new varieties during the present monsoon, to complete the area intended to be appropriated to these varieties.

5. Mr. McIvor reports having furnished Mr. Broughton, the Government Quinologist, with 35,072 lbs. of bark during the year for the manufacture of amorphous quinine. In connection with this subject, he states "that large quantities of amorphous alkaloids are available in London at 3 d. per ounce in rolls," and he suggests that our barks should be bartered for them. Upon this proposition Mr. Broughton, to whom I made a reference, writes: "The preparation which, in accordance with the instructions I received from the Home Government, I have recommended for adoption in this country as an effective febrifuge is amorphous in form; but as it contains the whole alkaloids in the proportion they are contained in the bark, it is nearly entirely susceptible of crystallisation. The amorphous quinine, which Mr. McIvor states can be purchased at 3 d. per ounce in England, is the refuse of the manufacture of the crystalline salts of the alkaloids, and contains what refuse to crystallise. It therefore is a totally different substance to that I am manufacturing from our red barks, and is more usually called in England quinidine."

The unsaleability and the accumulation of large stocks in the hands of manufacturers is some testimony to its comparative uselessness in medicine.

Mr. Broughton proceeds to say that he understands this substance was tried some years ago in the Madras Presidency, on account of its low price, before the introduction of the chinchona-plant to India, but was found ineffectual as a febrifuge, and its use was abandoned; and remarks that our barks, containing an ounce of alkaloid in the pound, sold for 2 s. 10 d. a lb. in the London market, and hence, that the manufacturer gave that price for an ounce of unmanufactured alkaloids, and therefore could not manufacture the real alkaloids at 3 d. per ounce.

6. During the year under report 7,294½ lbs. of bark were shipped to England for sale, and realised excellent prices. Mr. McIvor appears not to be very sanguine as to the success

success of the chinchona plantations in a commercial point of view. He remarks that the London market for quinine is not elastic, and that the consumption averages 1,411,636 lbs. of bark per annum, while the Government and private plantations together, when at maturity, will yield yearly 3,500,000 lbs of bark.

The actual expenditure on the Chinchona Department during the year 1870-71 was 29,490 rupees, out of a Budget grant of 45,400 rupees. The expenditure in the year under report has been 30,000 rupees, against a Budget grant of 34,337 rupees. This small excess will not, it is hoped, be viewed with dissatisfaction.

REPORT on the Progress and Condition of the Government Chinchona Plantations on the Nilgiris for the Official Year 1871-72.

THE early part of this year was most favourable for the growth of all varieties of chinchona, but the drought in December, January, February, and March has been unusually severe, and had a marked effect in retarding the growth of the younger plantations, while on the older plantations the effect was not so apparent. On the whole, the growth during the year has been satisfactory. The older trees maintained during the whole period luxuriant growth, with fine leading shoots. Where the trees have completely covered the ground, excluding the light from the surface of the soil, the growth has been most rapid, as in such places a fine deposit of new soil yearly enriches the land by the fall and decay of the leaves.

2. It has been found advisable to discontinue pruning, as when branches are removed by the knife or saw they are apt to leave a scar on the stem. Our older trees have already shown that pruning is much better to be left to nature, as when the lower branches become shaded by the luxuriant tops their growth becomes weakly, and they ultimately die and break off from the tree without leaving any scar or injury on the stem of the plant.

3. The largest plants of *C. Succirubra* average about 28½ feet in height, with a circumference of stem, at one foot from the ground, of 30 inches. The largest plants of *C. Officinalis* average 22 feet in height, with a circumference of stem of 16½ inches at one foot from the ground.

4. Of the new varieties of *C. Pitayensis* there have been permanently planted out on the—

Dodabetta plantation	-	-	-	-	-	-	500
Hooker	-	-	-	-	-	-	400

Of the new variety of *C. Officinalis*, termed *Lanceolata*, but now named *Angustifolia*, there has been permanently planted out on the—

Dodabetta plantation	-	-	-	-	-	-	300
Hooker	-	-	-	-	-	-	700

and of the new varieties of *Calisaya* on the Neddiwattam plantations, 2,750.

5. The above forms the only new land planted during the year; other operations being confined to filling up failures, keeping the plantations clean, opening drains, maintaining roads and buildings.

6. The number of new species propagated during the year are as follow:—

<i>C. Pitayensis</i>	-	-	-	-	-	-	12,213
<i>C. Angustifolia</i> (<i>Lanceolata</i>)	-	-	-	-	-	-	4,124

7. The number of plants distributed to the public is 5,000, and 44 ounces of seeds.

8. On the Hooker Estate a piece of fine well-sheltered land has been prepared, on which it is intended to plant five acres of each of the new varieties during this monsoon. This will complete the entire extent to be planted with the new varieties.

9. During the year 23,494 lbs. of fresh trunk-bark of the first quality and 11,578 lbs. of prunings have been supplied to Mr. Broughton, the Government Quinologist, for the manufacture of amorphous quinine.

10. In July 1871, 3,188½ lbs., and in January 1872, 4,106 lbs. of dry bark were forwarded to England for sale. Advice has been received of the sale of the first consignment, from which we learn that "old mossed succirubra bark" brought 2 s. 3 d. per lb. for pharmaceutical preparations, and 2 s. 7 d. per lb. for the extraction of quinine; while "small mossed bark" brought 2 s. 6 d., and "unmossed" 2 s. 10 d. per lb., both for pharmaceutical preparations. It is not stated what was realised for the bark of *C. Officinalis*. This bark, however, contains by far the largest proportion of quinine, and therefore does not appear to have realised a price proportionate to its value. Another fact worthy of remark is that the mossed barks have brought the lowest price; this is probably due to the altered appearance of the bark when subjected to the mossing process. The prices realised are, however, on the whole, most satisfactory, and leave no doubt that our Indian barks will shortly establish for themselves a position in the home market.

11. We have now taken, by the mossing process, the entire bark from the stems of 1,000 unselected *C. Succirubra* trees between eight and nine years of age, and find the yield of dry bark to be 2,988 lbs., or nearly 3 lbs. of dry bark per tree. The bark was taken at two periods; about one-third being removed in the early part of 1871, and the second portion of about two-thirds removed in October and November of the same year. The bark was removed from the stems only from the ground to a height varying from 8 to 12 feet, according to the size of the trees. Thus the produce of bark has turned out much greater than we expected, and indicates the great productive powers of our chinchona plantations. It would thus appear that chinchona cultivation, under good management, will prove a profitable investment, provided the market is not glutted by an excessive supply, so as to cause the prices to fall too low to be remunerative. On the Government chinchona plantations on the Nilgiris we may fairly estimate that we have at least one million of healthy plants which will attain maturity, and when the youngest of these plants have reached nine years' growth, we may safely calculate that the Government plantations alone will produce at least 1,500,000 lbs. of bark annually, containing on an average 6 per cent. of alkaloid, and that private plantations on the Nilgiris will produce about 2,000,000 lbs. of bark of a like quality. What effect this quantity of bark may have on the market it is impossible to conceive. At present it would appear that the quantity of bark above stated is more than sufficient to meet the demands of the whole world.

12. The exact quantities of Peruvian bark imported and exported into and from the United Kingdom is somewhat difficult to ascertain, as bark has been duty-free since 1815. Table I. in the Appendix, compiled by Mr. Money from the official returns, shows the yearly imports and exports for 30 years, or from 1841 to 1871, with the official prices of bark and quinine so far as they can be ascertained, the whole being complete from 1849 to 1871.

13. It will be observed, by a reference to this Table, that the reduction in the price of quinine does not seem to have increased the consumption, and that the total quantity of bark imported will scarcely average 1,411,636 lbs. per annum, while the average consumption of the United Kingdom may be estimated at between five and six hundred thousand pounds. The stock in hand in each year seems to have materially influenced the imports of bark, thus indicating that South America can supply any quantity of bark the market will take, provided the price is sufficiently high to be remunerative.

14. The cost of mossing, removing, and drying the bark from the 1,000 *C. Succirubra* trees above mentioned is as follows:—The first removal cost Rs. 41. 2 a., and the second removal Rs. 180. 11 a. 4 p., or making a total of Rs. 221. 13 a. 4 p.; the quantity of bark obtained being 2,988 lbs. will give the cost per lb. of dry bark 1 anna and 2 pies, or $3\frac{1}{2}$ d. per lb., as the actual cost of labour of removing and drying the bark, exclusive of the cost of superintendence. The cost will be somewhat diminished in the succeeding harvest, as the same moss can be applied for an indefinite period of time, as the moss, when once put on, grows and increases as well as the trees.

15. A disadvantage of the mossing process, especially when viewed in connection with the manufacture of alkaloids here, is that it necessitates the bark being taken during the months of April and May, the early part of June, and in October and November only. This throws at one time upon the hands of the Government Quinologist a larger quantity of bark than he is able to manufacture.

16. Mr. Broughton estimates that 20,000 lbs. of dry trunk-bark, similar to that sold in England for 2s. 10d. per lb., will be required for the manufacture of 800 lbs. of "amorphous quinine." In Europe the value of bark is estimated by the quantity of crystallisable alkaloid it contains, as there only crystallised alkaloids command a sale, while amorphous alkaloids are of little value, and large stocks have accumulated in that country. In India, however, the amorphous alkaloids are considered to be quite as effective as crystallised alkaloids. It therefore appears desirable that we should forward our barks for sale in the London market, and with the proceeds therefrom purchase what quantity of amorphous alkaloids we may require. I learn from Messrs. Howard & Sons, quinine manufacturers, Stratford, London, that they can supply "amorphous quinine" at 3d. per oz. in rolls. Thus 20,000 lbs. of bark at 2s. 6d. net in the London market will give a sum sufficient to purchase 12,500 lbs. of amorphous quinine; and as 800 lbs. of amorphous quinine can only be produced from that quantity of bark when manufactured here, it would appear to be greatly to the benefit of the plantations to dispose of the bark in the home market, and to purchase there such quantities of amorphous alkaloid as may be required for the use of the hospitals in this country.

17. Owing to the reduction of the establishment in the Chinchona Department it was found impossible to maintain a correct meteorological register; the usual meteorological tables, therefore, are not appended to this report.

18. The tea plantation has not been further extended, but a considerable nursery of tea-cuttings of the indigenous Assam, hybrid, and Chinese varieties have been formed. During the year 300 lbs. of fresh tea-leaves have been supplied to Captain Jennings.

19. A Table of the expenditure incurred on the plantations from 1860 to 31st March 1872 is appended.

(signed) *W. G. McIvor*,
Superintendent Government Chinchona Plantation.

Coimbatore, 24 May 1872.

TABLE showing the Imports and Exports of Chinchona Bark to and from the United Kingdom from 1841 to 1871.

YEARS.	Price of Quinine.	Value of Bark Imported per Lb.	Value of Bark Exported per Lb.	Calculated Stock beginning of each Year, starting at two Years, average Exports.	Quantity of Imports.	Quantity of Exports.	Excess Imports.	Excess Exports.	Imports above Average by.	Imports below Average by.	Five Years' Averages of Yearly Imports and Exports and Home Consumption.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
	s. d.	s. d.	s. d.	£.							
41 -	16 -	-	-	715,724	210,112	229,152	-	19,040	-	80,000	Imports - - 290,931 Exports - - 357,862 Home consumption per annum. 56,213
42 -	16 -	-	-	640,471	126,000	406,560	-	280,560	-	164,000	
43 -	16 -	-	-	303,698	312,928	450,688	-	137,760	22,000	-	
44 -	16 -	-	-	109,725	236,880	255,024	-	18,144	-	54,000	Imports - - 740,400 Exports - - 491,949 Home consumption per annum. 108,460
45 -	12 6	-	-	35,368	568,736	447,888	120,848	-	278,000	-	
46 -	12 6	-	-	100,000	799,312	433,888	305,424	-	-	1,000	
47 -	12 6	-	-	296,964	768,544	781,088	-	12,544	28,000	-	Imports - - 1,903,328 Exports - - 1,305,741 Home consumption per annum. 457,587
48 -	13 9	-	-	175,960	276,416	288,064	-	11,648	-	464,000	
49 -	16 -	-	-	55,852	737,744	407,568	330,176	-	-	3,000	
50 -	15 -	2 6	3 -	277,568	1,180,032	549,136	630,896	-	440,000	-	Imports - - 1,912,422 Exports - - 1,231,440 Home consumption per annum. 500,982
51 -	13 -	2 6	3 -	800,000	1,237,936	429,184	808,752	-	-	666,000	
52 -	9 3	2 6	3 -	1,151,165	2,039,072	1,130,304	908,768	-	136,000	-	
53 -	8 -	2 6	3 -	1,602,346	1,542,464	1,526,672	15,792	-	-	361,000	Imports - - 2,011,341 Exports - - 1,283,699 Home consumption per annum. 527,641
54 -	9 -	2 6	2 6	1,160,551	2,163,952	1,584,352	579,600	-	260,000	-	
55 -	8 3	2 4½	2 4½	1,282,564	2,533,216	1,858,192	675,024	-	630,000	-	
56 -	7 2	2 -	2 -	1,500,000	3,090,976	1,097,152	1,993,824	-	1,178,000	-	Imports - - 1,611,389 Exports - - 1,565,670 Home consumption per annum. 545,718
57 -	6 2	1 10½	1 10½	2,992,842	2,380,112	1,078,000	1,302,112	-	468,000	-	
58 -	5 10	2 2½	2 2½	3,793,972	2,008,120	1,299,760	708,360	-	91,000	-	
59 -	5 10	2 3½	2 3½	3,996,350	1,067,136	1,324,176	-	257,040	-	845,000	Imports - - 1,611,389 Exports - - 1,565,670 Home consumption per annum. 545,718
60 -	8 -	3 1	3 1	3,238,328	1,020,768	1,358,112	-	337,344	-	892,000	
61 -	6 6	2 8	2 8	2,400,000	1,397,424	1,056,384	341,040	-	-	614,000	
62 -	7 -	1 6	1 6	2,213,399	1,997,296	1,174,320	822,976	-	-	14,000	Imports - - 1,611,389 Exports - - 1,565,670 Home consumption per annum. 545,718
63 -	6 4	1 -	1 -	2,508,734	2,641,968	1,264,704	1,377,264	-	640,000	-	
64 -	5 9	1 1½	1 1½	3,358,357	2,282,896	1,279,488	1,003,408	-	271,000	-	
65 -	5 2	1 2½	1 2½	3,834,124	1,737,120	1,643,600	93,520	-	-	274,000	Imports - - 1,611,389 Exports - - 1,565,670 Home consumption per annum. 545,718
66 -	5 -	1 5	1 5	3,400,000	1,545,264	1,274,672	270,592	-	-	66,000	
67 -	4 9	1 5½	1 5½	3,124,874	1,005,760	1,490,270	-	484,512	-	606,000	
68 -	4 3	1 9	1 9	2,094,644	1,712,368	1,874,432	-	162,064	101,000	-	Imports - - 1,611,389 Exports - - 1,565,670 Home consumption per annum. 545,718
69 -	5 9	1 8½	1 8½	1,386,862	1,257,984	1,757,056	-	499,072	-	354,000	
70 -	6 3	1 8½	1 8½	342,072	2,535,568	1,431,920	1,103,648	-	924,000	-	
71 -	8 -	2 2½	2 2½	900,000	2,547,776	2,026,192	521,584	-	-	-	

Coimbatore, 24 May 1872.]

SANCTIONED ESTIMATE, Results of Expenditure, and Outturn of the Government
Chinchona Plantations, for the Year 1871-72.

PARTICULARS.	Superintendent and Office Establishment.		Propagation and Nursery Department.		Dodabetta Plantation.		Neddiwattam Plantation.		Pykara Plantation.		Mailkoondah Plantation.		Total. Estimate.	Total. Expenditure.
	Estimate.	Expenditure.	Estimate.	Expenditure.	Estimate.	Expenditure.	Estimate.	Expenditure.	Estimate.	Expenditure.	Estimate.	Expenditure.		
Establishment, including salaries.	Rs. 8,012	Rs. 8,023	Rs. 1,982	Rs. 2,135	Rs. 1,860	Rs. 1,891	Rs. 2,882	Rs. 2,729	Rs. 1,020	Rs. 937	Rs. 156	Rs. 120	Rs. 15,912	Rs. 15,833
Buildings - - -	-	-	250	125	300	100	350	150	100	125	-	-	1,000	500
Tool and store-rooms - - -	-	-	-	-	15	15	25	24	15	8	-	-	55	4
Coolies' quarters - - -	-	-	-	-	-	-	125	121	50	13	-	-	175	13
Felling - - -	-	-	-	-	-	-	50	-	50	40	-	-	100	4
Clearing and weeding - - -	-	-	40	-	4,000	3,461	4,000	3,099	2,000	2,190	147	147	10,187	8,899
Pitting - - -	-	-	-	-	500	360	500	370	300	175	-	-	1,300	90
Carriage of plants - - -	-	-	-	-	50	35	50	30	25	10	-	-	125	7
Planting and shading - - -	-	-	-	-	200	180	200	174	75	65	-	-	475	41
Road-making - - -	-	-	-	-	50	20	50	-	50	-	-	-	150	2
Tools - - -	-	-	-	72	100	100	200	125	100	50	-	-	400	34
Contingencies - - -	200	100	200	10	200	186	200	61	200	40	163	-	1,163	39
Clothing - - -	30	20	20	13	20	-	20	20	10	-	-	-	100	5
Various - - -	-	-	25	-	500	310	500	430	300	200	-	-	1,325	94
Collection of bark - - -	-	-	-	-	500	57	1,000	1,220	-	20	-	-	1,500	1,220
Carriage of " - - -	-	-	-	-	-	-	150	94	-	-	-	-	150	9
Mossing trees - - -	-	-	-	-	-	-	2,540	-	-	-	-	-	2,540	-
TOTAL - - - Rs.	8,242	8,143	2,517	2,355	8,295	6,715	12,842	8,647	4,295	3,873	466	267	36,757	30,000

Estimated Outturn of 1871-72.

35,072 lbs. Chinchona fresh bark supplied to Government Quinologists, at 4 annas per lb.	-	-	-	-	-	-	-	-	-	-	-	-	Rs. 8,768	a. -
7,294½ " " dry bark shipped for sale in England, at 1 rupee per lb.	-	-	-	-	-	-	-	-	-	-	-	-	7,294	8
44 " " seeds distributed gratuitously, at 4 annas per oz.	-	-	-	-	-	-	-	-	-	-	-	-	11	-
5,000 " " plants, at 2 pies each	-	-	-	-	-	-	-	-	-	-	-	-	52	1
Sale of tools - - -	-	-	-	-	-	-	-	-	-	-	-	-	70	-
TOTAL - - - - - Rs.	-	-	-	-	-	-	-	-	-	-	-	-	16,195	9

Ootacamund, 31 March 1872.

STATEMENT of Expenditure (1871-72) of the Government Chinchona Plantations on the Nilgiris.

PARTICULARS.	Superintendent and Office Establishment.		Propagation and Nursery Department.		Dodabetta Plantation.		Neddiwattam Plantation.		Pykara Plantation.		Mailkoondah Plantation.		TOTAL
	1860 to 1871.	1871-72.	1861 to 1870-71.	1871-72.	1860 to 1870-71.	1871-72.	1861 to 1870-71.	1871-72.	1862 to 1870-71.	1871-72.	1863 to 1870-71.	1871-72.	
Establishment, salaries, &c.	Rs. 73,177	Rs. 8,023	Rs. 38,262	Rs. 2,135	Rs. 40,825	Rs. 1,891	Rs. 81,946	Rs. 2,729	Rs. 12,559	Rs. 937	Rs. 9,485	Rs. 120	Rs. 2,72,080
Buildings - - -	-	-	14,093	125	20,521	100	22,865	150	3,458	125	3,138	-	64,577
Tool and store-rooms - - -	-	-	-	-	660	15	1,594	24	885	8	320	-	3,500
Coolies' quarters - - -	-	-	-	-	1,593	-	4,119	121	2,220	13	545	-	8,611
Felling - - -	-	-	-	-	4,568	-	9,227	-	7,536	40	4,952	-	26,333
Clearing and weeding - - -	-	-	1,000	-	16,138	3,461	27,302	3,099	17,247	2,190	11,044	147	81,631
Pitting - - -	-	-	-	-	9,290	360	15,215	370	6,452	175	4,623	-	36,445
Carriage of plants - - -	-	-	-	-	3,380	35	4,974	30	1,689	10	786	-	10,900
Planting and shading - - -	-	-	-	-	6,714	180	7,175	174	2,015	65	1,117	-	17,444
Trenching - - -	-	-	-	-	3,759	-	6,642	-	2,065	-	575	-	13,041
Inclosing - - -	-	-	548	-	5,337	-	4,552	-	1,845	-	1,080	-	13,360
Road-making - - -	-	-	-	-	7,129	20	5,757	-	3,441	-	2,371	-	18,717
Tools - - -	-	-	494	72	4,991	100	5,827	125	3,800	50	1,981	-	17,444
Contingencies - - -	731	100	2,413	10	5,711	186	7,768	61	1,833	40	1,104	-	19,900
Excavating - - -	-	-	172	-	1,094	-	1,195	-	-	-	-	-	2,281
Clothing - - -	149	20	352	13	250	-	361	20	158	-	85	-	1,220
Various - - -	-	-	-	-	2,260	310	2,662	430	460	200	303	-	6,923
Collection of bark - - -	-	-	-	-	-	57	616	1,220	-	20	-	-	1,923
Carriage of do. - - -	-	-	-	-	-	-	614	94	-	-	-	-	708
TOTAL - - - Rs.	74,057	8,143	57,334	2,355	1,84,220	6,715	2,10,411	8,647	67,663	3,873	43,509	267	6,17,110

Ootacamund, 1 April 1872.

ORDER of the Madras Government thereon, 20th August 1872.

THE above papers relate to the working of the Chinchona Department during the official year 1871-72. The unusual drought during December and three following months had the effect of retarding the growth of the young plants, but the older trees were not seriously affected, and, on the whole, the progress may be regarded as satisfactory.

2. Operations were restricted, in a great measure, to conservancy; it having been decided that attention should be directed to the propagation of new varieties exclusively, the extensions were necessarily limited. Of the new varieties of *Cinchona Pitayensis*, 900 seedlings were planted out, and 12,213 propagated. Of *C. Angustifolia* (Lanceolata), the number planted amounted to 1,000, and the number propagated to 4,124, whilst 2,750 plants of *C. Calisaya* have been added to the Neddiwattam plantation. During the present season the area allotted to each of the above three new species, namely, five acres, will be completely planted up, 15 acres of land on the Hooker Estate having been prepared for the purpose.

The number of plants distributed to the public was 5,000, against 602 in the previous year. The effect of discontinuing pruning should be carefully noted.

3. The total expenditure was slightly in excess of that for the previous year, namely, 30,000 rupees, against 29,490 rupees; but the cessation of operations on the Mailkoondah Estate having led to a reduction of expenditure on that estate to one-fifth of the sum laid out in the previous year, the working expenses of the other estates were really considerably heavier than in the preceding year. The excess appears to have been in the item "weeding and clearing" on the Dodabetta and Pykara estates. This point should have been noticed in the report. As the census of the trees will, it is presumed, be completed shortly, the superintendent will no doubt be in a position soon to submit his proposals regarding the allotment of a fixed sum per acre for working charges, as directed in paragraph 4, G. O., 8th June 1871, No. 1,011. The total expenditure on the Government chinchona plantations, from the commencement in 1860 up to the end of March last, is stated to have amounted to 617,194 rupees.

4. The value of the bark supplied to the Government Quinologist and shipped to England for sale during the year under report is estimated at a little over 16,000 rupees, or rather more than half the year's outlay.

5. A first consignment of 7,294½ lbs. of dry bark was dispatched to England for sale, and realised satisfactory prices, varying from 2s. 3d. per lb. to 2s. 10d. per lb.; it is noteworthy, however, that the "unmossed" bark, contrary to Mr. McIvor's expectations, fetched a higher price than the "mossed"—a result which is attributed by him to the altered appearance of the bark, owing to its having been subjected to the mossaing process; it would, of course, be premature to pass any judgment until the qualities of each description of bark have been thoroughly tested by further experiments. The comparative advantages of the coppicing and mossaing methods have still to be ascertained.

6. The Government Quinologist was supplied with 2,349 lbs. of fresh trunk-bark of the first quality and 11,578 lbs. of prunings for the manufacture of amorphous quinine. From paragraph 5 of the Commissioner's letter, it appears that Mr. McIvor is altogether mistaken in supposing that the so-called amorphous quinine, procurable in the home market at 3d. per oz. in rolls, is identical with the substance which is now being manufactured by Mr. Broughton under that name, and which, as Mr. Broughton explains, is amorphous in form only, but contains the whole alkaloids in the proportion in which they exist in the bark, whilst the article to which Mr. McIvor refers is the refuse of the manufacture of the crystalline salts.

7. It is satisfactory to learn that the yield of dry bark obtained from the mossed *Succirubra* trees averaged about 3 lbs. per tree, or half-pound in excess of Mr. McIvor's estimate (*vide* paragraph 8 of the Report for 1870-71, wherein a special report on the subject is promised). The effects of the mossaing process on the proportion of alkaloids as well as on the weight of bark yielded will be ascertained by experiments.

8. The rest of the report is devoted to an examination of the effect which will be produced upon the home market by the influx of the bark produced on the Nilgiri plantations (Government and private combined), which Mr. McIvor estimates to be capable of producing 3,500,000 lbs. of bark annually. The result at which Mr. McIvor arrives, on a consideration of the data afforded by a table, showing the imports and exports of Peruvian bark to and from the United Kingdom for a period of 30 years from 1841 to 1871, is that South America is equal to any demand that is likely to arise, provided the price is sufficiently high to be remunerative. The success of chinchona cultivation, as a commercial speculation, is, however, not a question which can influence the Government action, as their avowed object is to provide an abundant supply of the febrifuge at a rate so cheap as to be within the means of the population at large, and not to enter into competition with private growers.

9. Before sanctioning the discontinuance of the meteorological observations (which appear to have been made hitherto at Neddiwattam and the Botanical Gardens), the

Government desire to be informed, in greater detail, how the reduction of the establishment in the Chinchona Department renders it impossible to maintain a correct register. The rainfall should at least be registered.

10. The price at which the produce of the Government tea plantation is handed over to Captain Jennings does not appear to have been communicated to Government.

Enclosure 3, in No. 25.

From the Commissioner of the Nilgiris to the Secretary to Government, Revenue Department, Fort St. George; dated Ootacamund, 20th April 1871, No. 30.

IN continuation of my letter, No. 20, in reply to G. O., 7th February 1871, No. 249, I have the honour to report that, from inquiries I have made, I see no prospect whatever of being able at present to effect a sale on reasonable terms of the Pycarah and Mailkoondah chinchona plantations. I here note the receipt of Government Proceedings of 27th ultimo, No. 411, with Messrs. Money and Wauchope's proposal to lease the Pycarah plantation, which, up to the end of March 1870, had cost Rs. 64,696. The Mailkoondah plantation had cost Rs. 42,175 up to the same date.

2. Since the Government Proceedings under reply were passed, certain circumstances have come to light which induce me to urge Government to reconsider their order to sell the Pycarah plantation and the lower estate at Mailkoondah.

I. Though the survey of the Government chinchona plantations was ordered long ago, it is only lately that I have received plans of those at Pycarah and Mailkoondah, and I find the area by survey-measurement as follows:—

		Acres.
Pycarah - - -	{ Wood Estate - - -	69.65
	{ Hooker Estate - - -	146.33
		215.98
Mailkoondah - - -	{ Upper Estate - - -	16.36
	{ Lower ditto - - -	23.92
		40.28

Hitherto, accepting the estimate given by the superintendent, I have considered the area to be as follows:—

		Acres.
Pycarah - - -	{ Wood Estate - - -	128
	{ Hooker Estate - - -	172
		300
Mailkoondah - - -	Upper and Lower - - -	75

Making every allowance for the fact that the Survey Department go strictly by base-measurement, while Mr. McIvor estimates the area by the number of trees planted on the surface of the ground, which, to use a common simile, may be like the roof of a house while the survey-plan represents the floor, I was not prepared for a difference of nearly 100 per cent. in the Wood Estate. There cannot, I am assured, be any mistake in the survey-plan, and even if the slope of the ground were 1 in 2 all over (which is not so at Pycarah), Captain Sargeant affirms that the difference would only be 11.8 per cent. in favour of surface-measurement. There must, therefore, be some mistake in the number of the trees planted, or they must be planted at less intervals apart than 7 × 7, as I am informed. I have called upon Mr. McIvor to explain the difference and count the trees. When I get the plans of the Dodabetta* and Neddivattum plantations, there may be a considerable deficiency of area (as measured by the Survey Department) in them also, so that, even including Pycarah and the Upper and Lower estates at Mailkoondah, we may fall considerably short of 1,200 acres † of chinchona by survey-computation.

II. Since the return of Messrs. Broughton and McIvor from Bengal, I learn that whatever difference of opinion may exist as to the exact extent to which the Government chinchona plantations in Bengal are affected by canker, there can be no doubt that they

* Dodabetta area has just been furnished me by the Survey officer; it is 312.35 acres. Up to 31st March 1869 it was held to be 413 acres—see Superintendent's Administration Report for 1868-69, paragraph 16, Proceedings of Government, 5th August 1869, No. 68.

† The limit originally fixed by the Secretary of State for chinchona cultivation here.

they are suffering more or less from the disease, and that their condition is not entirely satisfactory.

For these two reasons, and considering that we do not yet know what amount of febrifuge the Government will require, nor even what quantity an acre of chinchona will yield, I submit that it would be improvident of Government to part either with the Pycarah plantation, or with the Lower estate at Mailkoondah.

3. I have considered the expediency of fencing the estates, as suggested by Government, and cannot recommend that course. If you will refer to Proceedings of Government, No. 265, 20th June 1867, and paragraph 22 of the Superintendent's Annual Report, you will see that the Wood estate was fenced round in 1866-67. What now remains of the fence is utterly useless against animals. The fact is, I do not believe that any permanent fence worthy of the name could be made on such ground, except with posts and wire, which would run up the cost to a sum out of all proportion to the necessities of the case.

4. The elk, no doubt, do considerable damage to condamineas until the top-shoots of the young tree get out of their reach; but as far as I can learn from a personal examination of the plantation, and from Mr. Dawson's experience, the elk do not perceptible damage to the succirubras. On the Wood estate the assistant superintendent informs me that there are only 19,000 condamineas; of the rest, 86,306 are succirubras, and 2,414 are micranthas; total, 107,720. On the Hooker estate there are 37,565 condamineas; of the rest, 96,598 are succirubras, and 10,317 are micranthas; total, 144,480.

Moreover, of these condamineas, a good number have attained a height out of reach of elk. I submit, therefore, that there is no necessity to go to the expense of a permanent fence.

5. I apprehend the Government desire to make some sensible reduction in the annual expenditure under the head of chinchona, and I think this may easily be achieved without the sale of any plantation, except the Upper estate at Mailkoondah, which is utterly worthless to Government as a chinchona plantation.*

6. You will refer to G. O., 29th November 1869, No. 3,065, and observe that on the budget estimate for 1870-71, I recommended a reduction of 10,274 rupees, and that the Government did not deem it safe to cut down the estimate to that extent, but reduced it by 6,192 rupees, leaving the total allotment for the year 45,400 rupees. When the superintendent sent in his estimate for 1871-72 for 39,100 rupees, I did not like to suggest a reduction, because the estimate so far fell in with my views as to exhibit a considerable decrease as compared with that for the previous year, and because I gathered from the Government proceedings on the 1870-71 budget, that they considered the chinchona plantations still somewhat in an experimental stage; and to ensure complete success they were disposed to have the estates managed on the "high cultivation" system, which demanded a more† than liberal grant for working charges.

7. I am, however, still of opinion, not only that the budget for 1870-71‡ could have been reduced by 10,274 rupees, as I suggested, but also that the budget for 1871-72 can be reduced to a figure below 39,100 rupees without imperilling the success of the plantations.

8. The sum assigned to the Assistant Superintendent of Neddivattum and Pycarah for last year's expenditure was as follows:—

<i>Neddivattum.</i>			
		<i>Rs.</i>	<i>Rs.</i>
1 Assistant Superintendent	150 × 12 =	1,800	
1 Overseer	50 × 12 =	600	
45 Gardeners, at 7	315 × 12 =	3,780	
			8,655
<i>Pycarah.</i>			
1 Overseer, at 70 × 12 =		840	
30 Gardeners, at 7, 210 × 12 =		2,520	
300 acres, at $\frac{5}{8}$ per acre		1,650	
			5,010
		<i>Rs.</i>	13,665

Hitherto

* It may even now or by-and-by have a certain value to somebody; in that the forest has been felled, the ground cleared, and there is a large quantity of iron roofing and building material on the premises.

† Mr. Melvor's letter, November 1869, No. 121, in Government Proceedings on the 1870-71 budget.

‡ Mr. Melvor, in his letter, dated 17th April 1871 (enclosed), says that the expenditure for 1870-71 will not, he believes, exceed 31,000 rupees; but he adds that in his anxiety to economise, the plantations have suffered.

*Pycarah	-	300
Neddivattum	-	450
		<hr/> 750

Hitherto, Neddivattum and Pycarah have been estimated to be 750 acres.* As Pycarah, by survey-measurement, is found to be - - - - - 215.98 acres.
It is probable that Neddivattum will be found to be about - - - 350

565.98

Say, in round numbers - - - - - 570

9. I am told by practical planters, that in their opinion, omitting all superintendence, a sum of 10 rupees an acre is sufficient to keep down weeds, repair roads and drains, &c., on estates on the Nilgiris. Where, therefore, a great portion of the estate is under chinchona-trees of five, six, and seven years of age, I infer that 10 rupees an acre is more than sufficient.

I propose, therefore, a budget for 1871-72, on the principle of allotting a sum for the working charges of each estate, calculated at the rate of 10 rupees an acre, part of such sum to be appropriated to the maintenance of a permanent staff of gardeners on each estate.

10. On this principle, I think the estimate for 1871-72 susceptible of reduction from 39,100 to 28,286 rupees, as follows:—

	<i>Rs</i>
1 Superintendent - - - - -	500 × 12 = 6,000
Ditto travelling allowance, 3 rupees a day - - -	= 1,100
1 Deputy Superintendent, as per contract - - -	= 1,742
1 Office Manager - - - - -	60 × 12 = 720
2 Propagators - - - - -	10 × 2 × 12 = 240
2 Peons for Chinchona Superintendent, at 8 - - - - -	8 × 2 × 12 = 192

9,994

Neddivattum and Pycarah (say 570 acres).

1 Assistant Superintendent - - - - -	175 × 12 = 2,100
1 Overseer, Pycarah - - - - -	70 × 12 = 840
1 Overseer, Neddivattum - - - - -	50 × 12 = 600
2 Peons at 7 - - - - -	7 × 2 × 12 = 168
Working charges, at 10 rupees an acre - - - - -	= 5,700

9,408

Dodabetta (312.35 acres).

1 Overseer - - - - -	70 × 12 = 840
2 Maistries - - - - -	12 × 2 × 12 = 288
Working charges - - - - -	313 × 10 = 3,130

4,258

Saderward and contingencies	As per original estimate for 1871-72.	-	1,216
Peons and clothing		-	100
Carriage of chinchona-bark		-	150
Repairs of buildings		-	1,000

2,466

Tea Plantation and Fish.

5 Gardeners at - - - - -	7 × 12 = 420
Fish experiments - - - - -	120

540

Botanical Gardens.

Government donation in aid - - - - -	100 × 12 = 1,200
1 Apprentice - - - - -	20 × 12 = 240
2 ditto 7½ rupees each - - - - -	15 × 12 = 180

1,620

Rs. 28,286

11. I propose

11. I propose expending no more money on the lower estate at Mailkoondah, but leaving it, by way of experiment, to grow up as a chinchona forest. I propose advertising for sale the upper estate at Mailkoondah, and parting with it for what it will fetch. As in future propagation is to be confined to new varieties, of which no more than five acres of each variety are to be planted, two propagators will, in my opinion, be sufficient. Now that Mr. McIvor has been relieved of the charge of the Botanical Gardens, and the Doda-betta plantation has been planted up, I think the services of an assistant superintendent, in addition to an overseer, unnecessary for Dodabetta.

I have struck out 1,500 rupees for collection of bark, as, in my opinion, that work can be done by the permanent staff of gardeners on the estates.

12. After coming to an independent conclusion on the estimate from a personal inspection of the plantations, and from inquiries from planters, I thought it best to send the estimate to Mr. McIvor, in order that he might go carefully into the question, and submit his views for the consideration of Government. He has kindly done so, and I enclose his letter, No. 7, of the 17th instant.

13. I should be sorry to imperil the success of our plantations, which, as I have repeatedly pointed out, do Mr. McIvor great credit. If it be thought that an allotment of 10 rupees an acre is insufficient for working charges *minus* supervision, then make it 12 rupees, or even more; but I submit that the time has arrived when the annual estimates of the superintendent should be framed on some fixed principle, in the interests of economy.

From the Superintendent of the Government Chinchona Plantations, to the Commissioner of the Nilgiris; dated Ootacamund, 17th April 1871, No. 7.

I HAVE the honour to acknowledge the receipt of your letter, No. 21, of the 14th instant, in which you are good enough to ask my opinion on a budget estimate for the chinchona plantations for 1871-72, which you intend submitting to Government.

2. I would respectfully bring to your notice that you submitted my estimate for the chinchona plantations and Botanical Gardens on 19th October 1870, and that the Government, in their proceedings in the Revenue Department, dated 4th January 1871, No. 8, approved of that estimate.

3. The Government, in paragraph 9 of their Order of the 7th February, No. 249, to which you refer, desire the reduction of expenditure on the chinchona plantations by the sale of or, if this cannot be effected, the abandonment of the Mailkoondah and Pycarah plantations, and not, as I understand, by working the plantations the Government at present intend to retain with an insufficient sum.

4. I have not yet disbursed all charges for the past official year, but, in round numbers, the actual expenditure for 1870-71 in the chinchona department and Botanical Gardens does not exceed 31,000 rupees.

5. The financial difficulties of the State and your urgent desire to reduce the expenditure caused me, during the past year, to avoid incurring any expense but that which was indispensable for the preservation of the plantations. The report also of Mr. Clark, the acting superintendent of the Bengal Chinchona Plantations, led me to believe that great success had been attained there without the high system of cultivation which I had previously pursued. Under these circumstances, I greatly reduced the labour employed in cultivation, and the result is that the young plants suffered considerably during the dry season, and to preserve and replace them will necessitate a higher standard of cultivation, and consequently a greater expenditure during the present year. If this is not done we shall lose, during next dry season, from a quarter to a third of the entire number of plants on our plantations. The opportunity I have lately had of inspecting the Government chinchona plantations in Bengal has also considerably modified my views as to the possibility of successfully working a plantation with rough cultivation. By far the greatest number of our chinchona plants are yet young, and consequently liable to be destroyed by being overgrown by weeds. It requires a growth of from four to six years (according to the species) to place chinchona plants beyond injury, and when young chinchona plants are choked by weeds during the monsoon, many die out during the dry season, and such plants as survive make slender and unsatisfactory growth. Apart from these disadvantages a great danger exists of plantations covered with weeds being entirely destroyed by fire during the dry weather. On your estimate our plantation cannot possibly be kept clean.

6. In my estimate, as sanctioned by Government, the sum of 1,500 rupees is entered for the collection of bark; you have struck out this item; and as the present time is the most favourable for gathering bark, I will feel obliged by your being so good as to inform me if it is your intention to discontinue the collection of bark.

7. I am deeply interested in the success of the Government chinchona plantations on the Nilgiri Hills, and view with alarm the system of cultivation you advocate with reference to this national undertaking, especially now when it is so closely approaching its full development,

development, and all the heavy expenditure has been incurred. Nevertheless, whatever sum the Government may consider it advisable to expend on the chinchona plantations, I shall endeavour to apply to the best possible advantage. During 1872-73 a reduction in the expenditure could be made without injury to the plantations.

ORDER of the Madras Government thereon, 8th June 1871.

IN proceedings of the 7th February last the Commissioner was desired to endeavour to effect a saving in the budget of the current year, which was 39,100 rupees, the estimate of last year having been 45,400 rupees, and the actual expenditure of the preceding year (1869-70) having been 47,055 rupees. The chief means suggested were the sale of the Mailkoondah and Pycarah plantations, which, it was stated, would still leave 825 acres planted for State purposes; or, failing this, the abandonment of the upper portion of the Mailkoondah plantation, and the filling-up of the lower portion with chinchonas, fencing it and the Pycarah tract, and allowing them to grow up as natural chinchona copse or forest.

2. The present letter of the Commissioner is in reply to this reference. Mr. Breeks despairs of finding purchasers for the estates on reasonable terms, and as the lately completed survey shows that the acreage of the whole of the plantations is considerably below their hitherto supposed extent, and the accounts given by Mr. McIvor and Mr. Broughton of the condition of the Bengal plantations is very unfavourable, he deprecates parting with more than the upper portion of Mailkoondah.

3. The Governor in Council concurs in this view, which, moreover, is in general accordance with the opinion of the Secretary of State in his recent despatch, above recorded. His Excellency observes that the upper portion of Mailkoondah is altogether useless as a chinchona plantation. It should be sold if possible. Meanwhile, he would retain Pycarah on the present system, and turn the lower plantation at Mailkoondah into a wild chinchona-wood, as an experiment, making proper provision for fencing or watching.

4. Mr. Breeks, it is observed, considers that the budget estimate may be reduced to 28,286 rupees from 39,100 rupees, or by rather more than 10,000 rupees. The chief alteration whereby this result is attained is the substitution of a fixed rate (10 rupees per acre) for working expenses. Mr. Breeks has fixed this sum on the advice of "practical planters." On the other hand, the Government have the assurance of Mr. McIvor, who has managed the plantations from their commencement, and who has witnessed the results of the management of the chinchona on economical principles in Bengal, that this sum will not suffice; that even with an expenditure of 31,000 rupees last year, the plantations have suffered; and that if a higher standard of cultivation be not adopted this year, the Government may expect a loss in the dry season of from a quarter to one-third of the entire number of plants.

5. It is possible, as the Commissioner admits in the 13th paragraph of his letter, that an assignment of 10 rupees per acre for working charges, exclusive of supervision, may be too low; but the Government entirely concur in the Commissioner's opinion that the annual estimates ought to be framed on a fixed principle, and that there ought to be no difficulty in determining what fixed sum per acre is sufficient for the working charges. With this view the exact acreage should be ascertained without delay, and a careful census should be taken of all the trees in all the plantations by actual counting. The Commissioner will arrange to have this done, and will employ careful and trustworthy persons on the duty. The superintendent will then submit a proposal as to the sum to be allowed for working charges per acre, specifying in detail the data on which his proposal is framed.

6. The Government approve of the proposal to reduce the assistant superintendent at Ooty; he may be sent to Neddivattum to replace Mr. Dawson, lately resigned.

7. The charges for the Government gardens and those for the chinchona experiment must in future be kept distinct. They will be budgeted for separately, and entered separately in the general budget of the Presidency. If, in view of the removal of the superintendent of the Doddabet plantation, the Commissioner thinks it advisable that Mr. McIvor should be relieved of the charge of the gardens at Burliar and Kulhutti, the Governor in Council will be prepared to sanction that arrangement, and to place the Burliar and Kulhutti gardens under the superintendent of the Ootacamund Garden.

— No. 26. —

(No. 36—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Duke,

Fort St. George, 10 December 1872.

IN the despatch dated 8th August 1872, No. 28, your Grace, in intimating to us the results of the sale of the chinchona bark from the Nilgiri Government plantations, which was transmitted to England in March last, remarked that Messrs. Howard offered only 2s. 4d. per lb. for the *C. officinalis* kind, while *C. officinalis* bark from a private plantation in the same locality fetched 3s. 6d. per lb.

2. We referred this part of the despatch to the Commissioner of the Nilgiris for report; and we now forward, for your Grace's information, our proceedings marginally noted, embodying explanatory letters from that officer and from Mr. McIvor on the subject.

Proceedings of
Government, 7 Dec.
1872, Nos. 46, 47.

We have, &c.
(signed) Hobart, &c.

Enclosure 1, in No. 26.

From the Commissioner of the Nilgiris to the Officiating Chief Secretary to Government,
Fort St. George; dated Ootacamund, 16th November 1872.

WITH reference to Government Order, Revenue Department, 16th October 1872, No. 1,429, calling attention to paragraph 3 of a despatch from the Secretary of State, dated 8th August last, in which it is intimated that Messrs. Howard were only able to offer 2s. 4d. per lb. for *C. officinalis* bark from the Government plantations, transmitted to England in the early part of the present year, while *C. officinalis* bark from a private plantation on the Nilgiris fetched 3s. 6d. per lb., and directing inquiry on the subject, I have the honour to enclose an explanatory letter from Mr. McIvor.

2. It appears that the private bark referred to was grown on the estate of Captain Jennings, at Dodabetta, at an elevation of 7,700 feet, and that the Government bark was produced at 5,600 feet. The inference follows that *C. officinalis* grown at a high elevation is richer in alkaloids than bark of that description grown lower down. Mr. McIvor, in the course of a conversation I had with him on the subject, recently informed me that *C. officinalis* produces the best bark at 7,500 to 8,000 feet, and that our main plantation of this species at Dodabetta is about this height. He stated that red bark, on the other hand, flourishes best at 6,000 feet.

3. Mr. McIvor, in his letter under reference, supports the implication of the value of the *C. officinalis* bark being dependent on the elevation at which it is grown, by the statement that bark of this description grown at the height of Captain Jennings's estate gave, on analysis, 4.46 of crystallised quinine, or nearly double the quantity afforded by the *C. officinalis* bark sold for 2s. 4d. per lb.

4. Mr. McIvor observes that the evidence available goes to show that the produce of the Government plantations is equal, if not superior, to the produce of private plantings.

From the Superintendent, Government Chinchona Plantations, to the Commissioner of the Nilgiris; dated Ootacamund, 31st October 1872, No. 100.

WITH reference to the Secretary of State's despatch in the Revenue Department, No. 28, of 8th August 1872, and your endorsement of the 17th instant, I have the honour to inform you that the officinalis bark bought by Messrs. Howard & Sons for 2s. 4d. per lb. was from the Neddivattum Plantation, grown at an elevation of about 5,600 feet, and obtained entirely from thinnings and prunings. This bark, by Mr. Broughton's analysis, gave 2.43 per cent. of crystallised quinine.

2. The private bark mentioned in paragraph 3 of the Secretary of State's despatch was (108 lbs. taken in 1871, and 192 lbs. taken in 1872) officinalis bark obtained from the stems under the mosing process by Captain Jennings, on his plantation at Dodabetta, and grown at an elevation of about 7,700 feet.

3. With our last consignment no bark of *C. officinalis* was sent from the Government plantations at Dodabetta, but three cases of this bark (Nos. 17 to 19) were sent in 1871, which gave, by Mr. Broughton's analysis, 4.46 per cent. crystallised quinine, showing the bark from the Government plantations at Dodabetta to be nearly double the value of that referred to by the Secretary of State as sold to Messrs. Howard & Sons at 2s. 4d. per lb.

4. In your endorsement a reference is made to the bark from the Deva Shola estate. I would observe that the highest price yet obtained for this bark is 2s. 2½d. per lb.

5. Apparently all facts which have yet transpired indicate the produce of the Government plantations to be equal or superior in value to bark grown on private plantations under the same circumstances. It should, however, be borne in mind that the Government plantations being experimental, the various species of chinchona were necessarily planted at different altitudes, and under various conditions, as regards aspect and exposure; consequently the bark of the same species may differ in value according to the locality in which it is grown.

6. I note with satisfaction that the red bark of the present consignment realised in the open market 3s. 1d., while bark of the same quality sold in 1871 for 2s. 7d. per lb.

— No. 27. —

(No. 18—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Duke,

Ootacamund, 11 July 1873.

WITH reference to your Grace's despatches marginally noted,* we have the honour to advise your Grace of the transmission to the India Office, by steamer, *via* the Suez Canal, of a parcel containing a collection of specimens of the flowering and fruit-bearing branches and of the barks of some of the chinchona species now growing on the Nilgiris.

*From Secretary of State, 27 September 1869, para. 3, No. 29, Public.
From Secretary of State, 11 January 1872, para. 4, No. 4, Revenue.

2. The Commissioner's report on the subject, with a letter from the Superintendent of the Chinchona Plantations, is herewith forwarded.

We have, &c.
(signed) Hobart, &c.

Enclosure in No. 27.

From the Commissioner of the Nilgiris to the Acting Secretary to Government, Revenue Department; dated Ootacamund, 23rd June 1873.

WITH reference to order of Government, No. 305, of 17th February 1872, and your Under Secretary's official memorandum, No. 84, of 18th April 1873, calling upon Mr. McIvor to furnish a complete set of the flowering and fruit-bearing branches and of the barks of the chinchona species now growing on the Nilgiris, I have the honour to forward an original letter from Mr. McIvor, explaining the cause of his inability to forward a complete set. Mr. McIvor, at the same time, transmits a collection, in triplicate, of such specimens as he has been able to obtain.

From the Superintendent, Government Chinchona Plantations, to the Commissioner of the Nilgiris; dated Ootacamund, 21st May 1873.

WITH reference to your endorsement on the official memorandum, Revenue Department, No. 84, dated the 18th ultimo, I have the honour to inform you that I am still unable to forward a complete set of flowering and fruit-bearing branches and bark of the various species of chinchonas at present growing on the Nilgiris, as many of the species and varieties we have in cultivation have not yet produced flowers and fruit. I however forward a collection, in triplicate, as per list annexed, of all the species and varieties which have flowered and fruited on the Nilgiris up to the present time, and these will be added to year by year as the new varieties come into bearing.

LIST of the Species of Chinchona.

	No. 1 - 3 specimens.		No. 14 - 3 specimens.
	" 2 - 3 "	Yellow bark	" 15 - 3 "
	" 3 - 3 "		" 16 - 3 "
	" 4 - 3 "		" 17 - 3 "
	" 5 - 3 "		" 18 - 3 "
Crown barks	" 6 - 3 "	Red bark	" 19 - 3 "
	" 7 - 3 "		" 20 - 3 "
	" 8 - 3 "		" 21 - 3 "
	" 9 - 3 "	Grey bark	" 22 - 3 "
	" 10 - 3 "		" 23 - 3 "
	" 11 - 3 "	Corkey bark	" 24 - 3 "
Yellow bark	" 12 - 3 "	Pahudiana	" 25 - 3 "
	" 13 - 3 "		

— No. 28. —

(No. 21—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Duke,

Ootacamund, 31 July 1873.

WITH reference to paragraph 4 of your Grace's despatch, 4th April 1871 No. 7 (Public), we have the honour to forward, for your Grace's information, our proceedings marginally noted, embodying an interesting report from the Government Quinologist on the results obtained by the application of Mr. McIvor's plan of mossing to the chinchona trees of the Government Plantations; also a letter from the Commissioner of the Nilgiris on the subject.

Proceedings of
Government, 29 May
1873, Nos. 221, 222.

2. Mr. Broughton expresses an opinion adverse to the mossing process as regards the red barks, and advocates the coppicing system. We, however, are not of opinion that his experiments have been sufficiently extensive to justify his condemnation of the mossing process; and the Commissioner's remarks in paragraphs 9 and 10 of his letter, if correct, would seem to show that this system is likely to be more profitable than the coppicing system.

3. We have given orders for the experiment advocated in paragraph 13 of the Commissioner's letter being at once undertaken; its final result will be duly communicated to your Grace.

We have, &c.
(signed) Hobart, &c.

Enclosure 1, in No. 28.

From the Commissioner of the Nilgiris, to the Chief Secretary to Government,
Fort St. George; dated Ootacamund, 19th April 1873.

I HAVE the honour to submit a report from Mr. Broughton on the comparative merits of the mossing system, which Mr. Broughton has, in compliance with paragraph 7 of Proceedings of Government, Revenue Department, requiring the opinion of the Commissioner, forwarded through me.

2. Mr. Broughton pronounces an opinion adverse to the mossing process in the red
273. M 4 barks

barks, but states that no final conclusion can be arrived at for the next three years. In the meanwhile, he complains that the coppicing system has never had as yet a fair trial, notwithstanding experiments were ordered to be carried out.

3. With regard to Mr. Broughton's condemnation of mossing red barks, it is necessary that, in order to a complete consideration of Mr. Broughton's conclusions, I shall indicate what his statements are. They are briefly these:—

1st. That mossed bark on young *Succirubra* is enormously superior to natural bark in the proportion of contained alkaloids.

2ndly. That the superiority diminishes with the age of the tree up to eight years, and at ten years (the oldest trees the Government possess) there is an equilibrium and no difference between the natural and renewed bark as respects alkaloids. Mr. Broughton concludes that the evidence available points to even a falling-off of the qualities of the mossed as compared with the unmossed natural bark as a tree ages, and appears to imply that coppicing will be found the best mode in the long run of taking the bark from the *C. Succirubra*.

4. I was lately at Neddiwuttum with Mr. McIvor and Mr. Broughton, when an inspection of the Neddiwuttum plantation was made. Wounding a tree was thus expounded. It was said that any incision was a blow aimed at the life of a tree, which the tree took time to recover in proportion to the extent of the wound. Thus it was said peeling the bark was wounding a tree, but coppicing a tree was inflicting a more radical wound; and the question arose whether minor wounds like peeling made at comparative frequent intervals would be most detrimental to the life of the tree, or performing radical operations at longer intervals—that is to say, coppicing a tree every seven or eight years. I understood from Mr. Broughton that his fear was that, if mossing was carried on, the mossed trees would, in course of years, die and require replanting. He inferred, on the other hand, that trees might be coppiced for hundreds of years like oaks in England, and thus the plantations would never require replenishing.

5. In order that the Government may have all the evidence which is available to enable them to test these views, I make the following remarks:—Fairly coppicing, that is to say, taking off the head of a tree completely as corn would be cut, is never, I am led to believe, carried out in oak coppices in England, except in the cases where there are no shoots near the bottom of the stem, and where, therefore, there is nothing to leave; and the reason is that depriving a stem of every shoot is so radical an operation that the life of the tree receives a shock from the operation very difficult for it to recover. Accordingly coppicing, as ordinarily carried out, is the felling of the tree, say, six inches from the ground, but leaving the shoots sprouting from the stool.

6. In my letter, in Government Order No. 126, dated 30th January 1873, I stated that 100 trees were thus fairly coppiced in 1866. I took note at Neddiwuttum of the largest of these coppiced trees. The shoots look weak and sickly. Their diameter is about an inch and a quarter at the bottom. I stripped a piece of bark from one of them, and found that when dried it presented a thickness no greater than blotting-paper. Mr. Broughton saw this tree, and looked over the other *fairly coppiced trees*. He was of opinion they had not sprung up again well, and attributed their weakness to an insufficiency of light and air.

7. These coppiced trees are intermediate trees, each flanked by untouched trees at a distance of 12 feet from them. It was a matter admitting of various opinions, whether the surrounding trees kept light from the coppiced trees; but one thing was clear, shoots springing from untouched trees were numerous in the vicinity of the coppiced trees; they were obviously kept from light and air much more than the shoots on the latter, and yet their appearance indicated great succulence and vigour.

8. The healthiness of the shoots on the uncoppiced trees gave rise further to a suggestion. It indicated that the mossing process could never destroy the trees on a plantation if a shoot was left on each tree. The main stems might be stripped of bark until they died, and a strong shoot be left all the time growing to take the place of the stem on the extinction of the latter. In this manner not a single tree on a plantation would be lost. The inference was that there was no need to run the risk of coppicing, because it was apprehended removing the bark from time to time under the mossing process might eventually destroy the trees.

9. The next point was the difference in the quantity of bark that would be afforded by mossing and that afforded by coppicing. At Neddiwuttum I took from an untouched and unmossed *C. Succirubra*, six years old, 2 lbs. of wet bark; the tree was mossed on decortication. In six months the tree will have grown higher, and will then yield perhaps 3 lbs. of natural wet bark. I should observe the 2 lbs. I took was not all the tree could have afforded. The tree was 19 feet high, and I stripped it to a height of 5 feet from the ground. Twenty months from my taking, the first renewed bark will be available, and six months after that the rest of the renewed bark. The renewed bark will aggregate two-thirds of the original bark; thus, in $7\frac{1}{2}$ years the tree will have given about 8 lbs. of wet bark. In a further 26 months another supply of renewed bark, equal
in

in quantity to the first renewed bark, will be available, and the tree will then have given 10 lbs. of bark.

10. Now, if this tree had been felled, it would have given, at the date I stripped it, 4 lbs. of bark to 4½ lbs.; and in eight years it would perhaps have re-grown, and have yielded about two-thirds of its yield on being coppiced; thus, in 14 years the tree would afford only, say, 7 lbs. against, say, 10 lbs. of bark in less than nine years by the mossaing process.

11. Then, as to the commercial value of renewed mossed bark, I understand Mr. Broughton to say that on trees at all ages it is richer in quinine than natural bark, and this is a very important point. I should observe that a difference of one per cent. in quinine makes a difference in price of 1³ pennies in the shilling; and if quinine is selling at 8 s. an ounce, therefore of eight times 1³ of a penny. Mr. Howard's analyses, in all his six reports, seem to corroborate the conclusion of the increased richness of renewed mossed bark in quinine.

12. These remarks apply entirely to the *C. Succirubra*. In his report, Mr. Broughton expressly states that in Condamineas mossaing affords a fairer prospect, and his appended analyses confirm this view.

13. With regard to *C. Succirubra* the adverse evidence is not, I submit, sufficient as yet to overbalance the evidence favourable to mossaing; and I would not, therefore, advocate coppicing experimentally on any large scale. Mr. Broughton, I believe, would not himself risk an extensive experiment. When we were at Neddiwuttum he pointed out four rows of *C. Succirubra* of 10 years old and upwards, which he proposes to coppice in May, leaving the shoots on the stool, and to compare these trees with four adjoining rows of trees which are to be mossed. He thinks this experiment will afford a fair test, and it will not in any way disfigure the plantation. I readily consented to this arrangement, subject to the approval of Government, which I now solicit.

14. In conclusion, I venture to remark on the complaint of Mr. Broughton that the coppicing, sanctioned in Government Order No. 1,646, dated 6th December 1872, was not carried out, that Mr. Broughton was the proper person to call attention to the neglect of the orders.

15. Mr. Broughton requests that six printed copies of his report may be furnished to him, and that he may have the privilege of revising the printer's proof of the report.

16. The delay in forwarding the report has been owing to my wish to inspect the Neddiwuttum plantation before submitting a personal opinion.

From the Government Quinologist to the Commissioner of the Nilgiris; dated Ootacamund, 11th February 1873.

I HAVE the honour to report on the results obtained by the application of Mr. McIvor's plan of mossaing to the chinchona trees of the Government plantations. The report is addressed to you as Commissioner of the Nilgiris, in consequence of the order conveyed in General Order No. 249 of 7th February 1871. Though the intention with which the proposition adverted to in the General Order cannot now be entirely carried out in consequence of the death of the late Commissioner, I fulfil in this report the letter of the General Order. Subject of Report.

2. The origin of the considerable experiments made in order to determine the practical value of the mossaing process arose from a suggestion made in a report of mine, dated 17th August 1868, in which the physiological effect of mossaing was discussed. In the General Order on this report, No. 2,453, of 22nd September 1868, and in General Orders, Nos. 3,068 and 426, of 9th December 1868, and 19th February 1869, respectively, a certain number of trees, amounting in all to 7,000, were directed to be treated by the mossaing process, in order to experimentally determine its practical value. Origin of the experiments.

3. The first determinations of the value of the process has been made by Mr. J. E. Howard previous to, and shortly after, my arrival in this country. They were necessarily made on a very small scale and on very young trees, whose age in no case exceeded five years. The results were very successful, and were corroborated to a certain extent by my own more early analyses. Mr. Howard's analyses.

4. The reasons which induced me to suggest the further trial of the process after these reports are the following:—The experiments were made on but a few trees; an extended trial might possibly, in some respects, modify the results; that the trees of the experiments were so young that it would not be possible to deal with such small plants on a commercial scale, and plants of actual crop-bearing age might possibly give different results. When the average yield of the natural bark of *C. Succirubra* is 7·2 per cent., the yield of the bark Reasons for further trials.

bark renewed under moss may not be so great in comparison as when the yield is but five per cent.

Experiment on 20 trees.

5. A further ground for my suggestion of an extended experiment arose from a careful trial of my own. Ten trees were barked on the 17th October 1867, being then 5½ years of age. The bark weighed 5,692 grammes, of which an analysis was made. On 4th May 1869, the renewed bark from the same trees was taken, which weighed 3,800 grammes, and an analysis was also made. I quote the results now for the first time:—

	Natural Bark, 5½ Years old.	Renewed Bark, under Moss, 18 Months old.
Total alkaloids - - - - -	5.66	9.27
Quinine - - - - -	2.15	3.43
Chinchonidine and Chinchonine - - - - -	3.51	5.84
Sulphate quinine obtained cry stallised - - - - -	undetermined.	2.58
„ Chinchonidine obtained crystallised - - - - -	„	4.88

As the renewed bark contained almost exactly the same amount of moisture as the natural bark, the trees had renewed under moss not quite two-thirds of their original weight of bark that had been taken in rather more than 18 months, though not then quite seven years old.

Deficiency of quinine in above result.

6. Though the foregoing is a successful result, the amount of quinine in the renewed bark appeared less than that apparently ascribed by Mr. Howard in certain instances on younger trees.

The amount of alkaloid in red bark has hitherto increased.

7. As many of my reports have shown, the bark of *C. Succirubra* has yielded yearly a larger amount of alkaloid, though the increment appears to be annually diminishing.

Will cessation of above increase affect the results of mossaing?

8. The question naturally occurred whether on older trees than the experiments dealt with, when the percentage of alkaloids is either increasing at a small annual rate, is stationary, or possibly diminishing, the mossed or renewed bark will have the remarkable richness found by Mr. Howard on bark renewed under moss on younger trees. It thus appeared very desirable for several reasons to attempt a larger experiment with the mossaing process.

Experiments have been conducted with irregularity; reasons of this.

9. It is now nearly four years since these experiments were commenced. The programme of their fulfilment has been carried out with irregularity, nor is it now complete to the end. The condition of the trees, the difficulty of applying labour at certain times, the state of the weather, &c., &c., have been the main practical reasons of the lack of precision in the carrying out of the plan determined on at the beginning. But it appears to me desirable, now that the trials have so far advanced, to communicate the results obtained, though three years more must elapse before the logical conclusion of the experiments.

Originally proposed plan of procedure.

10. The original scheme was as follows:—Trees of two ages of both red and crown barks were to have their trunks covered with moss for 18 months. A part of the original bark, assumed to be much improved by this treatment, was to be taken, analysed, and sent home for sale, and the trunks thus wounded to be quickly re-covered with moss, in order that the bark may renew in darkness. At the end of another 18 months, the bark thus renewed, which would be of fine quality, was to be again taken, analysed, and sent home for sale, the trunk being again mossed. After successive 18-month renewals, the bark of the second and third renewals was to be treated similarly.

Departures from above plan.

11. In performance, however, the Superintendent of the Plantations has considerably varied from this scheme. After six months had elapsed from the first taking the mossed original bark, a further quantity was taken, and, in some instances, the moss was extended higher up the trunks than was the case at first. The renewed bark under this treatment of the trees at the end of 18 months was too thin, or adhered too strongly to the cambium to allow of its removal; so that a longer time had to elapse before it could be taken. These changes exceedingly complicate the experiments and render the examination of the results by analysis a work of much labour. Furthermore, this treatment scarcely allows the cost to be strictly debited to the results, as would have been the case had the theoretical scheme been carried out. Unforeseen circumstances necessarily modify an experiment in India which has extended to so considerable a length of time.

12. At

12. At the present date the experiment has advanced so far that considerable amounts of mossed bark have been sent home for sale. At the time of present writing 600 or 700 lbs. of the renewed bark from the oldest trees is prepared for export. The renewed bark from the other trees cannot yet be removed from its slight thickness, though Mr. McIvor* and myself coincide in the opinion that its excellence is more marked at an age of 18 months; hence, the results at that age have been ascertained by analysis, although the bark cannot yet be removed for export.

Present state of the experiment.

13. The trees were first mossed between the months of May and August 1869. One thousand trees of 7 years of age, and 3,000 of 5½ years of *C. Succirubra* at Neddiwuttum, 1,000 trees of *C. officinalis* of 5 years, and 2,000 of 4 years of age, were thus treated, the age being at the time of mossing.

Time of the beginning of the experiment.

14. In order to secure a true estimate of the mean alteration in the quality of the bark a sample of mossed bark was taken from several trees, and its analysis compared with a sample of the natural unmossed bark from several trees growing under similar circumstances, both being taken from same height of trunk. This was done in order to avoid the error that might occur from employing the bark of single trees, which might possibly possess an exceptional yield. In many cases the analyses were repeated, and samples were taken at different times. I quote the results obtained from trees of *C. Succirubra* of 8½ years of age at the time of analysis :—

Mossed bark of oldest trees, results; 18 months under moss.

	Oldest Trees of <i>C. Succirubra</i> .			
	Analysed, 19 December 1870.		Analysed, 17 January 1871.	
	Mossed, Bark, 18 Months under Moss.	Natural Bark.	Mossed Bark, 19 Months under Moss.	Natural Bark.
Total alkaloids - - - - -	6.92	7.61	7.22	7.61
Quinine - - - - -	1.09	1.74	1.25	1.34
Chinchonidine and chinchonine - - - - -	5.83	5.87	5.97	6.27
Quinine obtained in crystals - - - - -	0.70	0.91	0.71	0.99
Other sulphates excluding chinchonine - - - - -	4.56	3.18	4.76	3.29

These analyses show that in trees of this age the total yield of alkaloids is not increased by mossing their bark, nor is the yield of quinine augmented. In both analyses a slight decrease in the amount of alkaloid is apparent, but this is compensated for by an increase of chinchonidine sulphate of more than one per cent. This increases the value of the bark for sale on the Continent of Europe, but scarcely for sale in England. Though the cost of the first mossing is, I believe, but 7½ pies a tree, I am quite of opinion that, for the improvement of the bark in trees of this age the application of moss is unremunerative. Though I attach but small importance to the fact, I may mention that the mossed bark on sale in England fetched a lower price than the natural bark. The alteration in the appearance of the bark produced by mossing, the state of the market, and the fancies of the purchaser, are the reasons of the want of precision that a single sale affords of the real value of the bark.

15. The 3,000 trees, aged 4½ years, were also mossed, and the bark taken for analysis

Mossed bark of oldest trees, results; 18 months under moss.

* Mr. McIvor states (Return, East India Chinchona, 1870, page 50): "As above mentioned, by the application of moss to the exterior of the bark the process of oxidation or waste is arrested and the alkaloids increased from 2½ per cent. to 15 or 20 per cent. Moreover, mossing more than doubles the bulk of the bark; thus making the direct yield of alkaloid per acre fully 30 times the quantity that can be procured under any other treatment. But this is a small advantage compared with the great one mossing affords, by enabling us to secure a yearly harvest of bark, without damage to the plants or arrest of the quinine-producing properties. By mossing every 12 or 18 months, the entire cellular bark of the stem can be removed with facility and without injury."

in a similar manner to the foregoing after being mossed about 18 months. The analyses are as follows :—

	Bark of <i>C. Succirubra</i> , 6 Years old.			
	4 May 1871.		22 May 1871.	
	Mossed.	Unmossed.	Mossed.	Unmossed.
Total alkaloids - - - - -	6·82	6·05	6·91	5·85
Quinine - - - - -	1·88	1·53	1·61	1·60
Chinchonidine and chinchonine - - - - -	4·94	4·52	4·76	4·25
Quinine sulphate obtained crystallized - - - - -	1·32	1·23	1·19	1·15
Chinchonidine - - - - -	3·11	2·16	2·15	2·05

Conclusions.

16. Hence, in these younger trees an increase in total alkaloids is perceptible, and also the amount of crystalline sulphates obtainable is augmented. The gain is less than was expected, and in the second set of analyses is scarcely perceptible. As the number of trees mossed was large, the two analyses express the yield of trees growing under somewhat different circumstances. As the cost of mossing these trees is nearly the same as that of the older trees, and the trees at this age are too young for their bark to be commercially cropped, I am of opinion that mossing trees of *C. Succirubra* for the improvement of their bark is unremunerative. In a footnote I quote analyses of Mr. Howard made with mossed bark supplied from younger trees.*

Mossed bark of oldest trees, results; 30 months under moss.

17. On 23rd January 1872, an analysis was made of a carefully selected mean specimen of the bark of the oldest mossed trees, which had been under moss about two years and six months. I compare it with a carefully obtained mean of two analyses of the natural bark, each derived from a specimen taken from several trees.

	<i>C. Succirubra</i> , about 9½ Years old.	
	Under Moss, 2½ Years.	Natural Bark.
Total alkaloids - - - - -	7·80	7·67
Quinine - - - - -	1·64	1·49
Chinchonidine and chinchonine - - - - -	6·16	6·18
Quinine sulphate obtained crystallized - - - - -	0·92	1·01
Chinchonidine - - - - -	3·65	3·50

18. On

* Return, East India Chinchona cultivation, 1866, page 134, Report dated 1st August 1865.

No. I.—Bark of three years and five months growth, thickened by the application of moss.

Crystallized sulphates per 100 parts - - - - -	6·00
Of alkaloid soluble in extra light ether - - - - -	0·94
Of alkaloid insoluble in the above: therefore chinchonine - - - - -	1·06

MEMORANDUM.—The sulphate refined into white sulphate of quinine in appearance; but this did not stand the test used for commercial sulphate of quinine.

Return, East India Chinchona cultivation, 1870, Report dated 4th February 1867.

No. II.—Original bark, six months under moss.

Crystallized sulphates - - - - -	-	4·57
Alkaloids soluble in ether (chinchonidine and quinine) - - - - -	-	3·78
Insoluble in ether, chinchonine - - - - -	0·80	
Chinchonicine - - - - -	0·11	0·91
		9·26

No. III.—*C. Succirubra*, original bark unmossed.

Crystallized sulphates - - - - -	-	4·50
Alkaloids soluble in ether - - - - -	-	1·71
Insoluble in ether, chinchonine crest - - - - -	0·40	
Chinchonicine - - - - -	0·34	0·74
		6·95

MEMORANDUM.—The sulphates as No. II.

18. On 2nd October 1872, a similar analysis was made of bark from the younger trees, which had been three years under moss; the trees being somewhat over eight years of age. I compare it with natural bark from trees growing under similar circumstances:—

Mossed bark of younger trees, results; 36 month under moss. Conclusions.

	C. Succirubra somewhat over 8 Years old.	
	Bark under Moss 3 Years.	Natural Bark.
Total alkaloids - - - - -	7.72	6.36
Quinine - - - - -	2.02	1.36
Chinchonidine - - - - -	5.70	5.00
Quinine sulphate obtained crystallized - - - - -	0.82	0.80
Chinchonidine " " - - - - -	8.57	4.02

Here it is apparent that in the younger trees the amount of alkaloids is increased in the mossed bark that has been three years under moss. The increase exceeds that apparent in the mean of the analyses of the bark of trees of this age mossed for eighteen months, by 0.75 per cent. But this total gain of 1.36 per cent. by three years' mossing consists of chinchonine and uncrystallizable quinine or quinicine, and does not add perceptibly to the market value of the bark. I submit, therefore, that the two analyses last quoted corroborate the conclusion I arrived at in the early part of the experiment, and stated in paragraphs 14 and 16. This conclusion is that the gain in quality produced by the application of moss to the bark of *C. Succirubra* does not compensate for the labour and expense of mossing the trees and keeping the bark under moss. To this it may be added that the conclusion is practically true, even if the bark be kept a considerable period under moss.

19. From the oldest trees that had been experimentally treated with moss as above, about 700 lbs. of renewed bark have been taken in December and January of 1872-73. The mean age of this bark is twenty months, and has been taken from trees whose age is a few months over ten years. The reason of this renewed bark not being cropped at the end of eighteen months is that at this time it could only be separated with difficulty from the cambium, and its cropping would be consequently attended with injury to the trees. I estimate its mean thickness at slightly less than half of the natural bark. As the thickness varies considerably, it is scarcely possible to obtain a completely accurate estimate. I should state that Mr. Melvor inclines to a somewhat larger estimate of its thickness than I do, but I give the above as more coincident with my own examinations. Of course, the more accurate method of comparing the yield would be to weigh the total products, but unfortunately the state of the trees will not permit of the whole of the renewed bark being taken; a strip only being taken from the centre of the long patch of renewed bark. It is believed that in May next, when the renewed bark will be two years old, the remaining portion can be taken and an accurate estimate of the respective yields will be then possible.

Thickness of renewed bark.

20. Two careful analyses have been made of the renewed bark, and the bark of several unmossed trees growing close by and under similar circumstances was analysed for comparison:—

Renewed bark, oldest trees; results.

	C. Succirubra.			
	Renewed under Moss.	Natural Bark.	Renewed under Moss.	Natural Bark.
Total alkaloids - - - - -	5.82	5.72	6.25	6.12
Quinine - - - - -	3.78	1.37	3.80	1.50
Chinchonidine and Chinchonine - - - - -	2.04	4.35	2.45	4.62
Quinine sulphate obtained crystallized - - - - -	2.81	0.50	2.87	0.85
Chinchonidine " " - - - - -	0.80	3.38	1.00	3.41

The above analyses show that the renewed bark is of superior quality to the natural bark. The amount of quinine is considerably increased, although much of it is uncrystallisable. The amount that crystallises as sulphate does so with a readiness somewhat resembling that of the quinine from crown barks. The renewed red bark is, however, inferior

inferior to the natural crown barks as a source of quinine. I am aware that this result differs somewhat from that of the analyses of Mr. Howard made some years since of the renewed bark from younger trees, but having no doubt of its accuracy, I communicate the fact as I find it.

Mean quality of renewed bark now exported.

21. An analysis of a carefully selected mean sample of this renewed bark now about to be sent home may be conveniently quoted here as corroborating the above results:—

	Mean Sample renewed Bark.
Total alkaloids - - - - -	5.38
Quinine and quinicine - - - - -	2.17
Chinchonine and Chinchonidine - - - - -	3.21
Quinine sulphate obtained crystallized - - - - -	1.7
Chinchonidine „ „ - - - - -	0.85

The bark renewed on the 3,000 trees of *C. Succirubra* of 8½ years of age had arrived at the age of eighteen months in October last. Though then at the greatest excellence of yield, it was too thin to be removed from the trees, adhering firmly to the wood below. A sample was, however, taken for analysis from three trees of average appearance, and compared with the natural bark of same age grown under similar circumstances. The renewed bark varied greatly in thickness which generally ranged from a fifth to a third of the thickness of the natural bark. The results of the analyses were as follow:—

	C. Succirubra from Trees 8½ Years of Age.	
	Renewed Bark 18 Months old.	Natural Bark.
Total alkaloids - - - - -	6.39	6.36
Quinine - - - - -	3.21	1.36
Chinchonidine and Chinchonine - - - - -	3.18	5.00
Quinine sulphate obtained crystallized - - - - -	2.30	0.90
Chinchonidine „ „ - - - - -	3.03	4.02

Renewed bark of younger trees; results.

22. Hence it appears that the renewed bark, though thin, had improved in quality over the natural bark. It contained almost precisely the same amount of alkaloid as the natural bark, but yielded more quinine, though much of this was uncrystallizable as sulphate. Though yielding somewhat less quinine than the renewed bark of the oldest trees, it had a certain advantage over the latter in containing more chinchonidine, giving a crystalline sulphate. From certain results I have during the last year obtained, I have come to the conclusion that as the red barks increase in age, the chinchonidine becomes partially replaced by chinchonine, and it also appears that the renewed barks considerably partake of the quality of the natural bark, as altered by increasing age.*

Results with bark three years under moss.

23. Though the above results are definite as far as they go, it appeared to me desirable that investigation should decide whether red bark renewed under moss would ever, on trees from which it could be profitably cropped, possess the high qualities that have been attributed to it. For that purpose I obtained a fresh specimen of some renewed bark that had

* Though a high quality has been ascribed to the bark of first renewal, the single analysis made by Mr. Howard scarcely confirms this opinion.

Return, East India (Chinchona Plant) 1866, page 134.

“No. 2 gave of crystallized sulphate - - - - - 5.00
 of alkaloid soluble in extra light ether - - - - - 0.90
 of alkaloid insoluble in extra light ether (chinchonine) - 1.80

Memorandum.—The sulphate refined into white sulphate of quinine in appearance; but this did not stand the test used for commercial sulphate of quinine.”

had been three years under moss. Its analysis gave the following results, which are compared with the natural bark of trees growing near:—

	C. Succirubra Trees 10 Years old.	
	Renewed 3 Years under Moss.	Natural.
Total alkaloids - - - - -	6.12	6.12
Quinine - - - - -	3.37	1.50
Chinchonidine and Chinchonine - - - - -	2.75	4.62
Quinine sulphate obtained crystallized - - - - -	2.27	0.85
Chinchonidine " " - - - - -	2.91	3.41

It, therefore, appears that three years' mossing does not improve the renewed bark.

24. Before discussing the general question of mossing the trees of red bark, I will first detail the results of the experiment of the application of moss to trees of *C. Officinalis* so far as it has hitherto advanced.

25. The crown barks of two ages, numbering about 2,000, were mossed at the same time as the red barks. At the end of about 18 months samples of bark were collected for analysis with much care, from trees growing under the same conditions and having the same general habit. Bark for comparison was taken from unmossed trees, growing under as like circumstances as could be found. The reason of the special care necessary in the selection of samples is that the bark of *C. Officinalis*, as I have frequently pointed out in previous reports is especially sensitive to the external circumstances under which the tree grows. This is shown by the considerable alteration produced in the amount of alkaloid in the bark by change of aspect, climate, or soil, circumstances which produce little alteration in the bark of *C. Succirubra*. The trees at the time of mossing were respectively about five and four years of age, so that at the time of taking the mossed bark their ages were $6\frac{1}{2}$ and $5\frac{1}{2}$ years. In most cases the analyses have been repeated to secure as complete an accuracy as possible. The results were as follows, quoting the results of both ages in one table, with a column expressing the difference produced by mossing:—

	C. Officinalis.					
	Trees, $6\frac{1}{2}$ Years old.			Trees, $5\frac{1}{2}$ Years old.		
	Mossed.	Unmossed.	Difference.	Mossed.	Unmossed.	Difference.
Total alkaloids - - - - -	7.41	5.26	2.15	4.73	3.10	1.63
Quinine - - - - -	4.57	3.48	1.09	2.96	1.62	1.34
Chinchonidine and Chinchonine - - - - -	2.84	1.78	1.06	1.77	1.48	0.29
Quinine sulphate obtained crystallized - - - - -	4.46	3.25	1.21	2.55	1.64	0.91
Chinchonidine " " - - - - -	1.74	2.04	0.70	0.94	1.14	0.20

26. The above results appear to me to be of great importance, and show a considerable divergence in the effects of mossing between *C. Officinalis* and *C. Succirubra*. In the elder lot of trees treated, which alone are of age for chopping, the amount of total alkaloids has been increased 2.15 per cent., of which 1.09 is quinine yielding nearly its due amount of sulphate. In the younger lot the gain of total alkaloids is also marked, being 1.63 per cent., of which 1.34 is quinine, of which a certain portion (though far less than is the case in red bark) is uncrystallizable, the gain in sulphates being 0.91. In

Satisfactory character of results.

the case of both trees a certain amount of the chinchonidine has been replaced by chinchonine as is shown by the negative difference of crystallised chinchonidine sulphate; but as regards the commercial value of the bark this circumstance has no appreciable effect. It may be roughly estimated that at the present price of chinchona barks the actual value has been increased in the elder trees by at least 9*d.* per pound, and in the younger by about 8*d.* In foot-note I quote the results obtained by Mr. Howard with mossed crown barks.*

Increase in elder barks by mossing, a hopeful sign.

27. The circumstance that the elder trees show in comparison with the younger trees even a greater increase appears to me a hopeful sign. This is entirely different to the red bark, and seems to show that up to the present time the effect of mossing does not diminish with the increased age of the tree. Whether it will eventually do so, experience alone can show. The mossing has, indeed, the ill effect of altering the appearance of the bark by destroying its characteristic lichens, and may even at first prevent its fetching its true value; but such a consequence must eventually cease under the influence of its substantially better quality for the quinine manufacturer.

Bark not increased in thickness by mossing.

28. At the time of analysis, as above mentioned, the thickness of the mossed bark was carefully determined by weighing equal areas of both the red and crown barks, as well as by direct measurement. From these experiments I conclude that in neither case has the bark been thickened by the application of moss. In both cases, the amount of water present in the bark has been somewhat larger than in the natural bark, but the effect of this, I think, will in practice be found of slight consequence.

Renewed bark from elder trees; results.

29. In October last, the bark had renewed under moss on the crown bark trees with much evenness, and was then two years of age, or six months older than the time ascribed as that of its best yield. But it was still found too thin for removal from the trees, and could not be cropped as intended. Notwithstanding this, it appeared to me desirable to examine it by analysis. Two specimens, each from several trees, were taken in different localities, and specimens for comparison were taken from unmossed trees growing under similar circumstances. The results obtained were as follows:—

	C. Officinalis Trees, 9 Years old.					
	Renewed Two Years old.	Natural.	Difference.	Renewed Two Years old.	Natural.	Difference.
Total alkaloids - - - - -	7·03	6·04	·99	6·93	6·04	·89
Quinine - - - - -	5·21	4·77	·44	5·17	4·77	·40
Chinchonidine and chinchonine - - -	1·82	1·27	·55	1·76	1·27	·49
Quinine sulphate obtained crystallized - -	4·57	4·80	— ·23	4·40	4·80	— ·40
Chinchonidine - - - - -	0·58	0·92	— ·34	0·60	0·92	— ·32

30. Before discussing these results, I will quote analyses of similarly collected specimens

* Return, East India (Chinchona cultivation), 1870, page 35.

No. 5, *C. Officinalis* var *B. Condaminea* (Bonplandiana), original bark, nine months under moss.

Crystallized sulphates - - - - -	6·66
Alkaloids soluble in ether, quinine, and chinchonidine - - -	0·56
Insoluble in ether, chinchonicine - - - - -	0·15
	8·02

Same Return, page 134.

No. 2, Strong growing variety of *C. Officinalis*, 8½ years old.

Crystallized sulphates - - - - -	2·92
Soluble in ether (chinchonidine and quinine) - - - - -	0·41
Insoluble in ether (chinchonicine and chinchonine) - - - -	1·20
	4·53

mens obtained from the trees of eight years old, in which, for entirely similar reasons, the renewed bark had been allowed to attain the age of two years:—

	C. Officinalis Trees, Eight Years Old.		
	Renewed Two Years Old.	Natural.	Difference.
Total alkaloids - - - - -	5.83	3.61	2.22
Quinine - - - - -	3.34	2.34	1.00
Chinchonidine and chinchonine - - - - -	2.49	1.27	1.22
Quinine sulphate, obtained crystallised - - -	3.13	2.10	1.03
Chinchonidine, " " - - -	2.60	1.44	1.16

Here, as on the trees of red bark, the yield of the renewed bark exceeds that of the natural bark, to the greatest extent on the younger trees. I cannot but consider this a discouraging indication, as it may signify that renewed crown-bark will not surpass the natural bark so greatly in after-years as when produced by young trees. But the yield of the renewed bark is absolutely greater even on the elder trees, and in this respect *C. Officinalis* considerably differs from *C. Succirubra*. In the elder trees the renewed bark is nearly equal in value to the natural bark; in the younger it exceeds the natural bark in money value by about 10*d.* per pound. This, of course, assumes that the renewed bark could now be removed from the trees for sale, which, as before stated, is not yet the case.

31. As in the case of the red barks, it appeared to me to be very desirable to ascertain whether a long continuance under moss in any respect improved the quality of the renewed crown bark. I therefore, by the kindness of Mr. McIvor, obtained specimens of bark renewed under moss from the oldest *Officinalis* trees. It had been under moss two years and four months. Natural unmossed bark grown upon trees under similar circumstances was analysed for comparison. The results were as follow:—

Renewed bark, 28 months under moss; results.

	C. Officinalis, Nine Years of Age.		
	Renewed under Moss Two Years and Four Months.	Natural.	Difference.
Total alkaloids - - - - -	5.58	5.10	0.48
Quinine - - - - -	4.23	3.42	0.81
Chinchonidine and chinchonine - - - - -	1.35	1.68	0.33
Quinine sulphate, obtained crystallised - - -	4.18	3.38	0.80
Chinchonidine, " " - - -	1.41	1.72	0.31

Here it is evident that in this case four months' increase of age under moss has somewhat improved the quality of the bark. But in so variable a bark as *C. Officinalis* I am not inclined to place much stress on this fact, inasmuch as the alteration in quality between the natural and the renewed bark differs but slightly from the case in which the latter was two years old.

32. Before discussing the results of mossing the trees, certain general consequences of the application must first be stated, which appear to me considerably to influence the results.

Certain consequences of mossing must be first discussed.

33. The crown barks, as I have in former reports had the honour of stating, possess in the highest degree the property of forming the crystalline sulphates with facility. Hence their

Certain improvements perceptible.

in renewed bark of
C. Succirubra.

their peculiar fitness for employment by the European quinine manufacturer. Mossing the crown-bark trees, or renewing their bark under moss, does not increase this admirable property, from the fact that it is already at a maximum. The red barks, on the contrary, have the bad quality of affording crystalline sulphates with difficulty. A covering of the bark with moss for eighteen months, however, diminishes this peculiarity, though, at the same time, it appears to increase the difficulty with which the alkaloids are obtained free from red colouring-matter. The renewed red barks, however, form crystalline sulphates with far greater ease than the natural bark, though even in this respect they do not rival the crown barks. The alkaloids of the renewed red barks, however, are contaminated with a red colouring matter in a greater degree than the natural bark, and from which there occasionally is some trouble in freeing them. This affects the value of the barks, though, I believe, in a less degree than the comparative ease of the crystallisation of sulphates. In the renewed barks it appears to me that the barks are exhausted of their alkaloids with greater ease than the natural barks.

Renewal affects
growth of tree.

34. The facility with which the bark, after being cropped, renews under moss appears to me to be the most important element in the application of the process. Mr. McIvor at first stated that the taking of the bark has no effect on the growth of the tree. No doubt small experiments on a few healthy trees led to this conclusion; but, notwithstanding, I have no hesitation in stating it to be erroneous. That so important a seat of the life of the tree as the bark can be taken from it without affecting its growth appears almost an absurdity. That it is not the case experience has conclusively shown, and I do not think even the superintendent of the plantations now holds the contrary. For some months after taking of the bark, the growth of the tree ceases; it appears unhealthy; the colour of the leaves changes to yellow or red, and it has generally a more or less sickly aspect. But after a time it recovers its health; the bark that has been taken renews with variable homogeneity, and after a year it reassumes its healthy appearance and growth.

Difficulty with *C.*
Succirubra.

35. As a matter of fact, the renewal of the red bark has not been entirely complete under the circumstances of the experiment. Nearly all the elder trees that I have examined had bare patches of wood, where the bark had not grown again after it had been taken. Among the younger trees there are also many trees on which the bark had not completely renewed. These trees are, of course, considerably injured by the treatment they have received, though I have not observed in any instance one that has actually died. Notwithstanding the many cases in which the bark has failed to renew, the younger red-bark trees are a mass of verdure at the present writing, the elder trees alone looking sickly. Mr. McIvor properly states that the application of the process of mossing is still an experiment, and that we have not at present the requisite experience to enable it to be performed without risk. I may mention that in consequence of Government Order, No. 1,213, of 13th July 1871, a very fine plot of 2,000 trees of *C. Succirubra* had its bark taken and the trunks mossed, the work being commenced on 15th October 1871, a time supposed to be favourable to the renewal of bark. I find by observation that 17 out of 20 trees, or 85 per cent., taken in various parts of the plot, have not renewed their bark. This plot, of course, forms no part of the experiment, though the result appears to me to be significant.

Renewal with *C.*
Officinalis more
certain.

36. On the other hand, the trees of *C. Officinalis* appear to me to renew their bark with far greater certainty, although the growth in thickness is slower than in the case with red bark. The quality of the renewed bark is also far finer, and is well suited for export. I am of opinion that even the renewed red bark will never be employed in English quinine manufacture as long as the market supplies sufficient crown bark, and when the good quality of the latter is thoroughly known. Notwithstanding that the cost of mossing the crown-bark trees at first has been 2 annas 11½ pies per tree, while that of the red-bark mossing has been but 7½ pies, it appears to me even now sufficiently evident that the process is more successful on the former, from the greater certainty of renewal, and the superiority of the product. It is greatly to be regretted that comparative experiments have not been carried out on coppicing the chinchona trees, in order that the most profitable means of collecting the crop might be experimentally determined.

Growth of moss
little advantage.

37. In the report of the Superintendent of the Chinchona Plantations for 1870-71, attached to Government Order, No. 1,237, of 20th August 1872, paragraph 14, it is stated that the applied moss grows and increases as well as the trees. I am unable to see the advantage of this ascribed tenacity of life, since the moss must be stripped off the tree half-yearly in order to remove the bark underneath, the wound being again recovered. Another increase of labour produced by the process is that a ladder is necessary for the removal of bark at heights exceeding seven feet, from which it is found that a coolie, instead of cropping 50 lbs. of green bark per diem, only crops 20 lbs. I mention these circumstances mainly to show that the consequences of the application of the process are more complex than at first appears.

Quality of renewed
bark depends on age
of tree.

38. The amount of total alkaloids which red bark renewed under moss contained was, by Mr. Howard's analysis in 1865, about 6.37 per cent. In May 1869 I obtained from the same 9.27 per cent. In 1872, from a similar specimen, I obtained but 6.03 per cent. The year 1869 was the age in which the most considerable yearly increase in the amount of alkaloids that I have observed took place, as well as that in which the largest yield of alkaloid in the first renewed bark is recorded. At the present time I have some reason
to

to fear that the bark of the eldest trees has arrived at, if not passed, the age of its maximum yield. It appears to me that the foregoing fact furnishes some indications that the quality of the first renewed bark is intimately connected with the changes taking place in the tree, and is highest when the natural annual increase of alkaloids is the greatest. The thickness of the renewed bark may also somewhat depend on the same causes.

39. From the foregoing considerations I am not inclined to look sanguinely on the effects of mossing the trees of *C. Succirubra*. Had the plan of coppicing been tried, a comparative and more definite opinion could have been arrived at. I am quite of opinion that no more trees should be mossed until the results obtained from the bark of second and third renewal show the actual results they promise from Mr. Howard's reports. The grounds on which I base my opinion are—firstly, the comparative thinness of the renewed bark; secondly, its moderate quality; thirdly, the somewhat uncertainty of its renewal; fourthly, the injury to the trees produced by taking the bark.

Mossing applied to *C. Succirubra* less successful.

40. On the trees of *C. Officinalis* these objections are less patent. The renewed bark, though thin, is of fine quality, and the renewal appears to be certain. I consider the plan of mossing, as devised by Mr. McIvor, applied to this species promises success. But nearly the whole of the chinchona plantations have now been mossed, so that, unless the application be stopped, there will soon be no trees left of an age on which so necessary a plan as coppicing can be fairly tried.

Mossing applied to *C. Officinalis* promises success.

41. In Government Order, No. 701, 19th April 1871, the Government assent to certain proposals of the Nilgiri Commissioner for the comparative trial of coppicing. In paragraph 3 of a letter of the same officer, attached to Government Order, No. 1,213, of 13th July 1871, he states "the same are being carried out," apparently believing it to be the case. But, with the exception of 200 trees of *C. Succirubra* which were felled in June 1871, the matter has hitherto been in abeyance.

Coppicing for comparison still a speculation.

42. The opinion which I hold that the success in export of the Indian chinchona plantations will, at least for the next 20 years, depend on the amount of the bark of *C. Officinalis*, *Calisaya*, and var. *Bonplandiana Angustifolia*, sent to Europe, far more than on red bark, receives hitherto, I submit, a further partial corroboration in the results detailed in the foregoing report, and the conclusions I found thereupon.

Results appear to corroborate estimates held of the chinchona species.

ORDER of the Madras Government thereon, 29th May 1873.

THE Government are obliged to Mr. Broughton for his interesting report. They are not, however, of opinion that his experiments have been sufficiently extensive to justify a general condemnation of the mossing process, as applied even to the old *C. Succirubra* trees, and they consider that the Commissioner's remarks in paragraphs 9 and 10 of his letter show almost conclusively (if his figures are correct) that this system is likely to be more profitable than the coppicing system which Mr. Broughton advocates.

2. Sufficient information is not, however, as yet available as to the certainty of a reproduction of bark after a tree has been stripped, and the statements made in paragraph 35 of Mr. Broughton's report, that 85 per cent. of a patch of 2,000 trees had failed in this respect, is a matter which should receive the Commissioner's and Mr. McIvor's gravest consideration.

3. The experiment advocated in paragraph 13 of the Commissioner's letter should at once be undertaken, and the number of trees which it is proposed to include in it should be reported.

4. No further mossing of the trees should be undertaken until the results of this experiment, which should be reported specially from time to time, are fully established, and the Government desire to know whether any experiments have yet been made as to the reproduction of bark without this artificial assistance.

— No. 29. —

(No. 24—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Duke,

Ootacamund, 12 September 1873.

YOUR GRACE will have learnt from our Proceedings of 16th October 1872, No. 1,433, forwarded with the letter marginally noted*, that it had been arranged to forward this year a large consignment of chinchona bark to England for sale in the open market.

*To Under Secretary of State, 24 April 1873, No. 15.

2. We have now the honour accordingly to advise your Grace of the transmission to the India Office by screw steamer "Othello," which left the port of Madras for London, *viâ* the Suez Canal, on the 12th ultimo, of 139 cases received from the Superintendent of the Government Chinchona Plantations, containing in all 23,646 lbs. of bark.

3. The papers on the subject, subsequent to our Proceedings of 16th October 1872, are herewith forwarded for your Grace's information.

* To Under Secretary
of State, dated 19
August 1873, No. 29.

4. The invoice and bill of lading for the 139 cases in question were forwarded to the India Office with the letter marginally noted,* with a request that the freight due thereon might be paid in London after measurement of the cases on arrival there, and the detailed invoice, as prepared by the Superintendent of the Chinchona Plantations, will be found recorded in the Proceedings last above quoted.

We have, &c.
(signed) *Hobart, &c.*

Enclosure 1, in No. 29.

From the Commissioner of the Nilgiris to Acting Secretary to Government, Revenue Department, Fort St. George; dated Ootacamund, 2nd April 1873.

GOVERNMENT, in their Order, No. 1,433, of 16th October last, approve of Mr. McIvor's proposal to consign for sale in the home market this year from 20,000 to 25,000 lbs. of chinchona bark. Mr. McIvor, in a letter, No. 161, of 24th ultimo (enclosed), reports that this quantity has already been collected, and states there is a further supply of 50,000 lbs. of bark available. He solicits permission to collect this supply and ship it.

2. It appears to me the additional available bark should be prepared and sent home. So large a quantity as 75,000 lbs. of bark thrown into the market at one time will tend to solve the question of the extent to which prices are likely to be affected by Indian bark, and it is desirable, in the interests of private owners of chinchona plantations, to obtain this information as soon as possible. A very large quantity of bark will, it is believed, be available next year.

3. Mr. McIvor brings to notice that Messrs. Stanes & Rouse have tendered to ship the bark from Calicut to London at the rate of 5 *l.* per ton of 50 cubic feet, at which computation a ton would cost in freight alone 170 rupees. On the score of economy, I would recommend that the consignment be made, as hitherto, direct to the Secretary of State.

From the Superintendent, Government Chinchona Plantations, to the Commissioner of the Nilgiris; dated Ootacamund, 24th March 1873.

WITH reference to the Proceedings of Government, No. 1,433, under date 16th October 1872, authorising the transmission to England of from 20,000 to 25,000 lbs. of chinchona bark, I have the honour to inform you that I have collected this quantity, and not gathered more than one-third of the bark available; I would therefore feel obliged by your being so good as to obtain the sanction of Government to our collecting during this season a further supply of from 40,000 to 50,000 lbs. of bark for the home market.

2. During this official year 80,000 lbs. of fresh bark have also been supplied to Mr. Broughton, the Government Quinologist, for the manufacture of amorphous quinine.

3. Messrs. Stanes & Rouse, of Coimbatore, have tendered for the transmission of the bark we are now packing for Europe, from Calicut to London, at 5 *l.* per ton of 50 cubic feet. Chinchona bark being light, this would make the freight of a ton of 20 cwt., from Calicut to London, 170 rupees; this, together with the carriage to Calicut, will form a heavy charge against the transmission of the bark. I therefore request to be informed whether the bark is to be dispatched, as hitherto, direct to the Secretary of State for India, care of the Secretary to Government, Madras, or through Messrs. Stanes & Rouse.

ORDER of the Madras Government thereon, 22nd April 1872.

REFERRED to the Acting Collector of Sea Customs, who is requested to ascertain and report the rate of freight per ton paid on the last consignment of bark per canal steamer, and the rates now ruling at this port.

Enclosure 2, in No. 29.

From the Acting Collector of Sea Customs to the Acting Secretary to Government, Revenue Department, Fort St. George; dated Madras, 14th May 1873.

IN reply to Government Order, Revenue Department, No. 427, of 22nd April 1873, I have the honour to inform you that I addressed the several agents to canal steamers to let me know the rate of freight per ton, and whether they would undertake the shipment of 75,000 lbs. of chinchona bark to London; they all replied in the negative, with the exception of Messrs. Binny & Co., who offer to ship the bark either on the steamer "Saltwell" or "Hindoo," leaving this on the 19th and 21st instant respectively, at the rate of 4 l. 10 s. per ton of 50 cubic feet.

2. Messrs. Binny & Co. wish to know how the bark is to be packed, and whether it is likely to damage other cargo.

3. The rate of freight paid on the last consignment of bark was 5 l. 15 s. per ton of 50 cubic feet.

ORDER of the Madras Government thereon, 28th May 1873, No. 541.

THE Government do not deem it advisable to accept Messrs. Stanes & Rouse's offer. The bark should be forwarded to the Collector of Sea Customs, who will have it shipped per canal steamer to the Secretary of State.

2. The Commissioner of the Nilgiri Hills will supply the Collector of Sea Customs with the information desired by Messrs. Binny & Co.

Enclosure 3, in No. 29.

From the Collector of Sea Customs, Madras, to the Acting Under Secretary to Government, Revenue Department, Fort St. George; dated Madras, 14th August 1873.

IN forwarding the invoice for 139 cases of chinchona-bark, together with bill of lading, in duplicate, received from Messrs. Binny & Co., the agents of the steamer "Othello," on board which the bark was shipped, I have the honour to request you will be good enough to forward them, *by the next mail*, to the Secretary of State for India, with an intimation that the freight due thereon should be paid in London after measurement of the cases on arrival there.

Enclosure 4, in No. 29.

From the Commissioner of the Nilgiris to the Acting Secretary to Government, Revenue Department; dated Ootacamund, 12th August 1873.

IN a letter to Government in Government Order, Revenue Department, 22nd April 1873, No. 427, I requested approval to a proposal of Mr. McIvor to collect 50,000 lbs. of chinchona bark to send to England for sale, in addition to 25,000 lbs. already ordered to be collected.

2. I annex a letter from Mr. McIvor, announcing the dispatch to Madras of 23,000 lbs. of bark out of the 25,000 lbs.

3. With regard to the additional 50,000 lbs. of bark, my letter was referred to by Government to the Collector of Sea Customs for a report on the rate of freight for bark. No instructions have been issued to me to have the 50,000 lbs. collected or otherwise. I have the honour to request instructions. The bark can be harvested in October; it cannot be taken earlier, owing to the monsoon.

4. I should observe that, contrary to Mr. Broughton's statement in paragraph 40 of his report in Government Order 28th May 1873, No. 549, Revenue Department, that "nearly the whole of the plantations have now been mossed, so that, unless the application be stopped, there will soon be no trees of an age on which so necessary a plan as coppicing can be fairly tried," there are, in the Government plantations, about 6,000 red-bark trees of 11 years old, and 18,000 crown-bark trees of 10 years of age *unmossed*.

5. If an additional 50,000 lbs. of bark are to be taken this year, these 24,000 trees will have to be stripped and mossed. In this event, the Order of Government, No. 716, dated 10th July 1873, Revenue Department, stating that no more trees are to be

mossed until the merits of coppicing have been ascertained, will, *ipso facto*, become modified.

6. I would venture to suggest an express modification of the order. A coppicing experiment sufficiently extensive to satisfy Mr. Broughton is now being conducted, and this experiment, or any other similar experiment, will take years to complete. In the meanwhile the unmossed trees on the plantations, if left untouched, will yield no revenue, and a serious consequence will occur besides. The bark on these trees will go on deteriorating; for Mr. Broughton, in paragraph 38 of his mossing report mentioned above, makes a remark indicating that, in his opinion (an opinion in which the information I have at my disposal leads me to coincide), the value of bark depends on the age of the bark, and not on the age of the tree, and the bark must not be beyond a limited age of a few years. He writes, speaking of certain trees: "At the present time, I have some reason to fear that the bark of the eldest trees has arrived at, if not passed, the maximum yield." I would suggest that Mr. McIvor should be at liberty to moss until the superiority of the mossing process is established. Nothing will be lost by this arrangement, because mossed trees, like unmossed trees, are capable of being felled by the axe and coppiced at any time desired.

7. In connection with the preparation of bark for shipment, I would suggest to Government the expediency of according a discretion to the Commissioner to collect bark as it becomes available, and to make arrangements for shipping it; reporting from time to time, to Government, the quantity collected and the quantity shipped, with the necessary details. In consequence of the delay in the issue of orders respecting the 50,000 lbs. of bark in question at the present moment, a favourable season for taking the bark has passed, and some months must elapse before the bark can be gathered.

From the Superintendent of the Government Chinchona Plantations, to the Commissioner of the Nilgiris; dated Ootacamund, 31st July 1873.

WITH reference to the Proceedings of Government, Revenue Department, dated 16th October 1872 and 28th May 1873 respectively, I have the honour to inform you that I dispatched, between the 18th and 28th instant, the whole of the cases of chinchona bark, 139 in number, to the Collector of Sea Customs, Madras, to be shipped to the Secretary of State for India.

2. The invoice is enclosed. By it you will observe that 11 cases, Nos. 51 to 61, inclusive, of branch red bark has been forwarded, and 13 cases of branch crown bark, being bark rejected by Mr. Broughton as valueless for his manufactory. Mr. Broughton's process differs in some degree to that employed at home, and this bark may consequently prove of fair value in the home market, and, under any circumstances, it appears desirable to ascertain the price Nilgiri branch bark is likely to command in the home markets, and with this object these cases have been forwarded.

ORDER of the Madras Government thereon, 5th September 1873.

It appears that, in order to carry into effect the proposal of the Commissioner, that 50,000 lbs. of bark should be collected for shipment to England, it will be necessary to moss all the unmossed trees in the plantations of 11 and 10 years of age. Relying on Mr. Broughton's statement that "nearly the whole of the chinchona plantations had been mossed," the Government, in their Order, dated 29th May 1873, No. 549, directed that no further mossing of the trees should be undertaken until the superiority of the mossing over the coppicing system had been established. Under the circumstances now stated, however, they are pleased to direct that of the 24,000 trees of 11 and 10 years old, one-fourth, or 6,000, situated in different parts of the plantation, shall be retained for coppicing, and that three-fourths, or 18,000, shall be mossed after being harvested. It is probable that this will restrict the projected harvest somewhat below the estimate of 50,000 lbs., but this is not a matter of any moment. Similarly, the application of moss will not be carried out in regard to more than three-fourths of the remaining trees of the plantations; care being taken that at least one-fourth of the trees planted in each year are reserved for experimental coppicing, in case it should be hereafter determined to carry out that system further.

2. With reference to paragraph 7 of the Commissioner's letter, the Governor in Council is pleased to authorise him to use his discretion in collecting the bark for the home market and in making arrangements for its shipment to England, submitting, from time to time, reports on his proceedings as proposed.

3. A copy of Mr. McIvor's letter, with the invoice enclosed, will be forwarded to His Grace the Secretary of State.

-- No. 30. --

(No. 30—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Duke,

Ootacamund, 26 September 1873.

IN continuation of our Despatch, 12th instant, No. 24, advising your Grace of the transmission, in August last, of 23,646 lbs. of chinchona bark to England for sale, we have the honour to forward our proceedings marginally noted,* embodying a letter from the Government Quinologist, containing analyses of the several samples of the bark in question.

*Proceedings of Government, 8 September 1873.

2. We beg to invite your Grace's attention to Mr. Broughton's remarks in paragraph 2 of his letter on the subject of putting the branch bark into the home market, and to the observations of the Commissioner of the Nilgiri Hills in paragraphs 3 to 5 of his letter of 12th August 1873.

3. With advertence to the last enclosure in our Despatch above quoted, we take this opportunity of informing your Grace that the respective merits of the "mossing" and "coppicing" system of treating the chinchona tree are now engaging our attention.

We have, &c.
(signed) *Hobart, &c.*

Enclosure 1, in No. 30.

From the Government Quinologist, to the Acting Secretary to Government, Revenue Department; dated Ootacamund, 9th August 1873.

I HAVE the honour to append analyses of the several samples of chinchona bark now being sent to England, according to the list of specified kinds furnished me by the Commissioner of the Nilgiris. The analyses are given in the following table, and are expressed in per-centages of quite dry bark:—

	Mossed Red Bark, Neddivutium.	Renewed Red Bark, Neddivutium.	Grey Bark.	Red Bark, Neddivutium.	Red Bark, Pykara.	Branch Red Bark.	Crown Bark, Neddivutium.	Crown Bark, Pykara.	Mossed Crown Bark, Dodabetta.	Crown Bark, Dodabetta.	Branch Crown Bark.
Total alkaloids	6.20	5.82	2.75	4.45	5.11	3.58	4.32	3.42	6.60	3.61	0.91
Quinine and quinicine	1.14	3.25	—	1.31	0.97	1.33	3.08	2.32	3.89	2.07	—
Chinchonidine and chinchonine	5.06	2.57	2.75	3.14	4.14	2.25	1.24	1.10	2.71	1.54	—
Pure sulphate of quinine, obtained crystallised.	0.74	2.62	—	0.74	0.62	0.81	3.11	2.39	3.86	2.04	—
Pure sulphate of chinchonidine, obtained crystallised.	3.47	0.88	1.00	1.61	2.22	1.14	0.85	0.67	1.00	0.99	—

* Mean of three analyses.

† Mean of two analyses.

2. Certain branch crown bark has been sent, contrary to my advice, given under the belief that, even if it sell for a good price, its quality will ultimately prejudice the reputation that Madras chinchona bark should seek to obtain in the market.

Enclosure 2, in No. 30.

From the Commissioner of the Nilgiris, to the Acting Secretary to Government, Revenue Department; dated Ootacamund, 12th August 1873.

I HAVE the honour to acknowledge the receipt of a letter, in original, to your address from the Government Quinologist, dated 9th instant, forwarded for my observations.

2. The letter contains Mr. Broughton's analysis of samples from 23,000 lbs. of chinchona bark recently despatched to England for sale. With regard to this analysis I have no remark to offer at present.

3. In paragraph 2 of the letter Mr. Broughton states: "Certain branch-bark has been sent, contrary to my advice, given under the belief that, even if it sells for a good price, its quality will ultimately prejudice the reputation that Madras chinchona bark should seek to obtain in the market." Upon this point I beg to quote paragraph 4 of a despatch from the Secretary of State, printed in Government Order, Revenue Department, 11th July 1870, No. 1,022: "The plantations will require thinning from time to time, and strict injunctions should be given that no bark, not even that of the smallest twigs, should be wasted." The branch bark referred to by Mr. Broughton was bark rejected by that gentleman, in the last official year, as unfit for the use of the factory at Neddivuttum. Mr. Broughton refers to this bark in paragraph 2 of his letter in Government Order, 9th July 1873, Revenue Department, No. 714. The alternative was either to throw the bark away or to send it to England.

4. Irrespective of the instructions of the Secretary of State quoted above, it appeared to me proper that trunk and branch bark should be sent to England indiscriminately, because only by the consignments containing indifferent as well as superior parcels could there be a possibility of learning the average price of bark. Mr. Broughton appears to be of opinion that the main object is to obtain a good name for Nilgiri bark. I apprehend, on the contrary, that the object is to learn the price of all descriptions of bark, for the sufficient reason that the production of bark is undertaken by Government in part to pioneer for commerce and private parties growing chinchona, obviously must send home their bad as well as their good bark, and want to ascertain the price of both qualities as soon as possible by means of Government sales.

5. The Government will observe that Mr. Broughton seems to think it possible the branch bark will fetch a fair price.

— No. 31. —

(No. 32—Revenue.)

From the Government of Madras, to the Secretary of State for India.

My Lord Duke,

Ootacamund, 10 October 1873.

Proceedings of Government, 13 September 1873.

WE have the honour to forward, for your Grace's information, the Administration Report of the Government Chinchona Plantations on the Nilgiris for the year 1872-73, together with our proceedings of 13th September 1873, No. 981, containing the observations and orders recorded by us on the subject.

We have, &c.
(signed) *Hobart, &c.*

Enclosure 1, in No. 31.

From the Commissioner of the Nilgiris, to the Acting Secretary to Government, Revenue Department; dated Ootacamund, 10th July 1873.

I HAVE the honour to submit the Administration Report of the Government Chinchona Plantations on the Nilgiris for 1872-73. I take the opportunity to reply, at the same time, to Government Order, No. 549, dated 29th May last, Revenue Department, upon the report of Mr. Broughton upon the respective merits of the mossing and coppicing systems. The

The Government Order remarks upon a statement of Mr. Broughton that 85 per cent. of 2,000 trees, from which the bark was stripped in October 1871, have failed to renew their bark; that this instance of the failure of the mossing system should receive the Commissioner's and Mr. McIvor's gravest consideration.

2. Mr. Broughton's report is dated the 19th April 1873, or about 17 months after the removal of the bark. In paragraph 10 of his present report, Mr. McIvor says: "Originally it was believed that renewed bark could be taken at 18 months' growth, but now it is found that 20 months to two years' growth is necessary for the easy removal of the renewed bark."

3. Mr. McIvor informs me that the 2,000 trees referred to by Mr. Broughton are, at the present moment, in the most luxuriant possible health, and that he has already commenced to remove the renewed bark. I suspect that Mr. Broughton, in referring to these trees, intended to point out that they had been tardy in putting on the renewed bark, and not that he feared the bark would not renew. I infer this from the circumstances well known that no tree could survive if it was stripped of bark as chin-chona trees are stripped, and did not at once commence a more or less rapid reparatory process.

4. The observation is made in paragraph 1 of the Government Order, that the Government consider the Commissioner's remarks, in paragraphs 9 and 10 of his covering letter to Mr. Broughton's report, "show almost conclusively (if his figures are correct) that the mossing system is likely to be more profitable than the coppicing system which Mr. Broughton advocates."

5. I beg to state that my figures were under, not over, the mark. The present report of Mr. McIvor proves this to be the case by facts. Paragraph 9 says that 200 *C. Succirubra* of 1862-63, and 40 plants of 1864-65, were coppiced in May 1871, and yielded 355 lbs. of dry bark; and paragraph 10 states that 1,000 *C. Succirubra*, of 1862-63, were stripped also in 1871, but in the month of February. These trees yielded at that time, though this information is not in the report, 1,030 lbs. of dry bark. In October last year the second harvest of natural bark was removed, amounting to 1,950 lbs. of dry bark, and recently the first harvest of renewed bark, that is to say, the renewed bark from the spaces yielding the 1,030 lbs. of natural bark, amounting to 764 lbs. of dry bark. These 1,000 trees planted in 1862-63 have, therefore, already yielded 3,744 lbs. of dry bark, and in October next the renewed bark will be taken from the spaces which yielded the 1,950 lbs. of dry bark; and this harvest will probably amount to 1,200 lbs. of dry bark, because the trees have expanded in size since the 1,950 lbs. was stripped. In my calculation I will exclude the latter renewed bark, amounting to 1,200 lbs.

6. The coppiced trees above mentioned were 240 in number, and 40 of them were, when coppiced, two years younger than the 1,000 trees. I do not know what bark the 200 trees gave, and I shall, therefore, consider the 240 trees as equal to one-fourth of the 1,000 trees, and all as of the same age. The calculation is not fair to the coppiced trees, but it is not so unfair as to vitiate altogether the argument I found on the calculation; because the comparison is so immensely in favour of the mossing process that small errors are unimportant. The 240 trees then yielded 355 lbs. of dry bark, and the trees, though in selected localities, that is to say, selected in order that the results might be favourable to coppicing, have as yet, as I am personally aware, only thrown up shoots as thick as a walking-stick covered with bark which when dry curls, and is no thicker than blotting paper. I saw these shoots early in the year. Mr. McIvor, in his present report, says that the south-west monsoon has rendered them more vigorous; but he does not mean to say that the growth hitherto arrested has suddenly become luxuriant. He uses the modified paragraph 9 of his report, the shoots are "becoming more healthy." These coppiced trees, at all events, will not be fit for a harvest of bark to be taken for a long term of years.

7. I put, then, the hitherto yield of the 240 coppiced trees against the hitherto yield of one-fourth of the 1,000 mossed trees. The result is that the former yield is 355 lbs. against 936 lbs. in the latter case. The figures speak for themselves, and yet there are other considerations favourable to mossing. They are, first, that mossed bark is richer in quinine than natural bark; second, that the 1,000 mossed trees will shortly give a further harvest, whereas the 240 coppiced trees will not give an additional harvest for a very long time.

8. I desire to call attention to the support the views I expressed on the coppicing system received from Mr. McIvor's present report. At paragraph 12 Mr. McIvor, referring to the trees already coppiced, and speaking of them as in selected sites, states: "A large extent of land coppiced without selection could not but add fresh testimony to the already unsatisfactory results obtained by this system."

9. With regard to the coppicing directed in the Government Order under reference, I believe it has already been done; but I shall report specifically on this subject, and

submit some remarks on the last paragraph of the Government Order when I hear from Mr. McIvor.

10. In paragraph 4 of the report, it will be observed by Government that Mr. McIvor has furnished 83,894 lbs. of wet bark, equal to 33,000 lbs. of dry bark, to Mr. Broughton during the past year, and that he has collected 25,000 lbs. of dry bark for sale in the home market, and proposed to collect 50,000 lbs. more. Upon the latter point the instructions of Government have not yet been received. In all, then, the harvest of bark for the past year, if all taken, amounted to 108,000 lbs. of dry bark, worth, at 2s. a pound nett all round, and this is a low price, 1,08,000 rupees. Further on, in his report, Mr. McIvor refers to the number of trees on the Government properties capable of yielding commercial bark, and shows that not one-twentieth of the trees are fit to be cropped. Mr. McIvor, however, tells me that, notwithstanding, he expects a crop of dry bark in the current year, amounting to the crop available in the past year, and in 1874-75 a crop of double the quantity. After that Mr. McIvor expects the annual yield will be very large.

11. The Government will observe that Mr. McIvor is not of opinion that manure will increase the alkaloids in the barks of chinchona trees. He is, however, experimenting with manure, and will report upon the subject in due time.

12. Mr. McIvor, under the head "Cultivation" in his report, urges that the amount at present allowed is not sufficient for the proper up-keep of the chinchona plantations. I have conferred with Mr. McIvor on the subject, and suggested his placing his views in detail on paper, when the matter can be considered. This he will do. He tells me that he is of opinion a staff of gardeners is urgently necessary to take, under the mossing system, the large harvests of bark available and expected. He declares that, had it not been for the unskilled manner in which the bark was removed from the 2,000 trees referred to by Mr. Broughton in paragraph 35 of his mossing report, there would have been no room for Mr. Broughton's strictures. Had the bark been skilfully removed, he believes the fresh bark would have appeared long ago.—His general assertion is that clumsy removal of bark by untrained men causes great injury to the chinchona trees.

Enclosure 2, in No. 31.

REPORT on the Government Chinchona Plantations on the Nilgiris for 1872-73.

IN submitting this report I have much satisfaction in being able to state that the season has been favourable for the growth of all the species of chinchona. The health and vigour of the plants have never been finer than they are at present. The *C. officinalis*, as it attains age, assumes a fine tree-like habit, with increased growth; the bark also continuously increases in thickness, and improves in appearance.

2. Our propagating operations are now entirely confined to the new species and varieties of Pitayo barks and *C. angustifolia*; the average monthly increase of these varieties during the year being 1,050; the total number of plants propagated being 12,602. The number of plants in permanent plantations, including the young plants in the nurseries and propagating houses on 1st April 1873, was 2,640,081. The number of plants issued to the public during the year is 9,200; the quantity of seed issued gratuitously being 25½ oz., making a gross total of 407½ oz., or seeds sufficient to raise 8,150,000 seedlings. The number of plants permanently planted out during the year is 13,885; there being planted on the Hooker Plantation at Pykara 4,961 plants of *C. angustifolia* and 7,394 of *C. Pitayo*, and on the Dodabetta Plantation 1,000 *C. angustifolia* and 500 *C. Pitayo*; making the total number of plants in permanent plantations 1,170,029 on 30th April 1873.

3. Among the oldest plants which were planted in permanent plantations in the autumn of 1862, a small block of 58 plants selected by Mr. Broughton for the coppicing experiment were cut down. Among these was a plant 36 feet in height. The largest of the 12 measured plants of *C. succirubra* planted out at the same time measure 30½ feet in height, with a circumference of stem of 28 inches. The largest of the 12 measured plants of *C. officinalis* planted on the Dodabetta Plantation in September 1863 measure 23 feet in height, with a circumference of stem of 7½ inches.

4. The quantity of green bark supplied to Mr. Broughton during the year for the manufacture of amorphous quinine is 83,894 lbs. in all, viz., 33,391 lbs. stem-bark and 50,503 lbs. of branch-bark. During the official year 2,072½ lbs. of green tea-leaf has been supplied to Captain Jennings from the Governmental Experimental Tea Plantation at Dodabetta.

5. In the autumn and spring 25,000 lbs. of dry bark was collected for sale in the European

European market in compliance with Government Order, No. 1,433, dated 16th October 1872. On completing this quantity of bark, it was found that not more than one-third of the whole quantity of bark available had been taken; I therefore, in my letter No. 161, dated 14th March 1873, recommended that a further supply of from 40,000 to 50,000 should be collected and despatched to Europe for sale in the home market. The whole of the stem-bark collected during the last official year has been taken by the mossing process. A large supply of bark is now available for the local manufactory.

Recorded in Government Order, No. 427, dated 22 April 1873.

6. In June 1871 the cultivation of the Malakoondah Plantation was abandoned or "converted into a wild chinchona wood," in compliance with Government Orders, No. 1,011, of 8th June 1871, and No. 1,193 of 11th July 1871. No expense has been incurred on this plantation since July 1871. Notwithstanding the fact that this plantation has not been cultivated for nearly two years, the stronger plants have maintained a fair growth, but the smaller plants have been overgrown and smothered by the weeds and growth of jungle-trees. In many instances, the jungle growth is now beginning to overtop the larger plants, and, if not removed, will, I fear, shortly destroy many of them. The result of the experiment of leaving chinchona to develop themselves into a forest does not promise to be successful, at least at Malakoondah. It is quite evident on the Nilgiris that true economy demands an expenditure sufficient to keep down weeds and undergrowth until the chinchona plants have attained a growth of eight or 10 years, or until they so entirely cover the ground that their shade destroys the natural vegetation under them.

7. In previous reports I have observed that red bark plants do not become productive until their eighth or 10th year of growth, and that from the 10th to the 12th year, according to situation and exposure, the crown-barks become productive. To remove bark from young trees, except in very favourable situation, is no doubt injurious.

8. It is not generally understood that at present there is not 1-20th part of the plants on the Government Plantations on the Nilgiris which have attained sufficient age to produce bark. The number of red bark plants planted in 1862-63 was 12,500; in 1863-64, 7,700; in 1864-65, 38,500. It will thus be seen that we have now only 58,700 red bark plants old enough to be productive, while the present year is the first that the crown-barks are capable of yielding bark in any considerable quantity. I append a table to this report, showing the number of plants in permanent plantations and the dates on which they were planted. This table gives a fair idea of the quantity of bark we may expect from the Government Plantations year by year; but in forming an estimate it is necessary to take into consideration the various circumstances affecting the yield of the trees. Plants placed in rich soil and sheltered situations will produce three or four times as much bark as plants of the same age planted on poor land and in exposed places. It is also necessary to make a deduction from the total number of plants planted out in any given year of about 30 per cent. for failures subsequently filled in.

9. In May 1871 a block of 200 *C. Succirubra* trees of the planting of 1862-63, also a block of 40 plants of the planting of 1864-65, were selected by Mr. Broughton and coppiced. These blocks were on some of the best land and in sheltered localities. The total yield of bark from these plants was 720 lbs. of green stem-bark and 324 lbs. of green branch-bark, or in all a total of 1,044 lbs. green bark, equal to about 255 lbs. dry stem-bark and 100 lbs. of dry branch-bark; in all 355 lbs. The shoots from the roots of these coppiced plants made unsatisfactory growth for the first two years. Now, however, they are becoming more healthy.

10. In my report of last year I informed the Government that from the 1,000 experimental *C. Succirubra* trees, planted in 1862-63, 2,980 lbs. of dry bark had been taken by the mossing process. We have now taken the first strip of renewed bark from these trees, and find it to be 764 lbs. of dry bark; the original bark from the same spaces having weighed 1,030 lbs. In the autumn and spring of next year the entire quantity of renewed bark will be removed from these trees. When this is completed the cost of removal per pound of dry renewed bark will be given. Originally it was believed that renewed bark could be taken at 18 months' growth, but now it is found that 20 months to two years' growth is necessary for the easy removal of the renewed bark.

11. As before noticed the whole of the barks produced this year has been taken by the mossing process only. The experience gained by Mr. Broughton has led that gentleman to consider that mossing is not the most profitable way of harvesting red bark.

12. In my letter, No. 48, of the 26th June 1871, to the late Commissioner of the Nilgiris, I recommended that, while this matter was undecided one-half of the bark collected from the plantations be procured by mossing, and the other half by coppicing. In compliance with Government Order, No. 1,213, dated 13th July 1871, the whole of the stem-bark, both for England and the supply of the Mr. Broughton's manufactory, was procured by the mossing process alone. Mr. Broughton complains that all the trees of an age to produce bark have been mossed, and few remain on which the coppicing experiment can be fairly tested. This is an error, as, in fact, of our oldest red bark trees (12,500 of the planting of 1862-63), there are fully one-half unmossed. Should the Government consider it desirable, in order to test the value of the two systems, and to arrive at definite conclusions, an extensive experiment can be carried out by coppicing on this portion of the

plantation that half of the trees which has not been mossed. These trees are now in their eleventh year of growth, and of an age most favourable for the coppicing experiment. Mr. Broughton also represents that the coppicing process has not had a sufficiently extensive trial fairly to test its value. This is no doubt correct: the few trees coppiced have been selected in favourable situations, and consequently do not give any idea of the result which would be obtained from a large extent of land coppiced without selection. Were such an extent of land coppiced, the yield of bark per tree would turn out to be from one-half to two-thirds less than that obtained from the patches already coppiced. In fact, a large extent of land coppiced without selection could not but add fresh testimony to the already unsatisfactory results obtained by this system.

13. In compliance with Government Order, No. 584, 10th April 1872, on Mr. Broughton's report on the effects of manure in increasing the production of alkaloids in chinchona barks, arrangements have been made during the year for the extensive application of manure to our plants especially to the crown-barks. I however consider it necessary to bring to the notice of Government that there are certain circumstances connected with the production of alkaloids especially in the various varieties of crown-barks which tend to deprive the results obtained by Mr. Broughton of much of their value. The best results obtained by manure in increasing the alkaloids was when applied to *C. officinalis* and Mr. Broughton attributes the effects produced on this species to a sensitiveness to the effects of manure. There are other causes which Mr. Broughton slightly notices which, to some degree, explains the results he obtained. The *C. officinalis* is the richest of all the species in quinine. Mr. Broughton has explained that it is very variable in its yield of alkaloids. In order that we may not be disappointed in the results likely to be produced by manure, I beg to draw attention to the fact that the variability in the bark of the different varieties of this species is almost beyond belief. On the first Dodabetta plantation, consisting entirely of plants raised from imported seeds of *C. officinalis*, may be taken samples of bark identical in appearance from similar trees growing under equal conditions. One sample of which will, on analysis, yield the extraordinary quantity of 11.4 per cent. crystallised sulphate of quinine, and the other yield not a trace.

14. Varieties are found varying in every degree between these extremes. Such being the fact, it will be easily understood that samples of bark gathered from the manured and unmanured rows of trees might, on analysis, have pointed to any conclusion, and it would be equally possible to show results proving the application of manure to be highly injurious instead of beneficial. In short, with plants varying in their alkaloids as crown-barks do, unless the selection of bark be made with very careful reference to the different varieties, any result may be obtained and proved by a perfectly accurate investigation and analysis. I may mention that the red barks do not vary so much in the yield of quinine as the crown-barks do; and this may account for Mr. Broughton having found that the manure applied to these plants produced comparatively insignificant results. The variation in the yield of alkaloids, especially quinine, in the red barks is from half to 2 per cent. according to the variety. The red flower and large-leaved variety produces most, the white flower variety less, and the small leaf variety in some situations contains no quinine or merely a trace. Not only does the variety of the plant vary in its yield of quinine, but these also again vary according to the situation in which they are grown.

15. Our manuring operations have been pressed forward as rapidly as possible. Five thousand trees of *C. officinalis* have been manured at Neddiwuttum, and 458 of the same species at Dodabetta with farmyard manure. The artificial manure so kindly supplied for trial by Messrs. J. MacMeikan & Co., Melbourne, has been applied to 355 plants of *C. officinalis* on the Dodabetta Plantation. The artificial manure indented for, and sanctioned in Government Order No. 858, dated 1st June 1872, has not been received.

Cultivation.—During the preceding and the present official year, the expenditure having been reduced to the lowest possible point, the high system of cultivation previously maintained in our plantations has not been carried out. I would, however, again bring to the notice of Government that the results of the last two years' cultivation makes it evident beyond doubt that, if the plantations are to be fully developed, it is indispensable that a more liberal system of cultivation be maintained, at least for three or four years, on the younger portions of the plantations.

16. Appended is a table giving the rainfall at Neddiwuttum, and a table of expenditure from 1860 to the 31st March 1873; also a table showing the number and date of the plants placed in permanent plantations.

Establishment.—Up to the end of March 1871, the chinchona plantations were worked by a permanent establishment of well-trained gardeners, additional hands being merely called in to perform rough work. For objects of economy the late Commissioner recommended that the plantations should be worked on an estimate of 10 rupees per acre, exclusive of superintendence. The Government approved of this system being adopted, and sanctioned 12½ rupees per acre per annum. In consequence of this, it was impossible to maintain permanently our trained establishment, and the men not having constant employment sought other situations; and we have since been obliged to work our plantations with such coolies as we are able to engage at the seasons when their labour can be applied

Government Order,
No. 1,428, dated 16
October 1872.

Government Order,
8 June 1871.

applied to the greatest advantage. This system has been in operation for two years, and it has been found impossible to perform with accuracy any operation requiring care and attention by the untrained and inexperienced men we are obliged to employ. This system has no doubt reduced expenditure, but the absolute loss and injury done to the plants greatly exceeds any saving which has been effected. Experience has convinced me that whatever may be the sum sanctioned for the working of the chinchona plantations, it would be very beneficial to maintain a fixed establishment of well-trained gardeners, their number being limited to the expenditure proposed to be incurred. The establishments on the plantations have now been reduced to one assistant superintendent, three overseers, and three maistries. Even in the higher grades all of our experienced men have left the department, with the exception of Narrainsawmy Naidu, who joined at the commencement of the undertaking. With the zeal, application, and energy displayed by the assistant superintendent, overseers, and office manager, I have every reason to be well satisfied.

STATEMENT of EXPENDITURE, 1872-1873, of the Government Chinchona Plantations on the Nilgiris.

PARTICULARS.	Superintendent and Office Establishment.		Propagation and Nursery Department.		Dodabetta Plantation.		Neddiwuttum Plantation.		Pykara Plantations.		Malakoondah Plantation.		TOTAL.
	1860 to 1871-72.	1872-73.	1861 to 1871-72.	1872-73.	1860 to 1871-72.	1872-73.	1861 to 1871-72.	1872-73.	1862 to 1871-72.	1872-73.	1863 to 1871-72.	1872-73.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
ment, salaries,	81,200	8,127	40,397	240	42,716	1,620	84,675	3,132	13,496	1,020	9,605	-	2,86,228
- - -	-	185	14,218	43	20,621	195	23,015	330	3,583	53	3,138	-	65,381
storerooms -	-	-	-	-	675	-	1,618	-	893	-	320	-	3,506
quarters -	-	-	-	-	1,593	150	4,240	58	2,233	24	545	-	8,843
- - -	-	-	-	-	4,568	-	9,227	-	7,576	-	4,952	-	26,323
and weeding -	-	-	1,000	459	19,599	2,420	30,401	2,712	14,437	1,960	11,191	-	89,179
- - -	-	-	-	-	9,650	70	15,585	140	6,627	199	4,623	-	36,894
of plants -	-	-	-	-	3,415	12	5,004	44	1,699	124	786	-	11,084
and shading -	-	-	-	-	6,894	40	7,349	70	2,080	142	1,117	-	17,692
- - -	-	-	-	-	3,759	-	6,642	-	2,065	-	575	-	13,041
- - -	-	-	548	-	5,337	-	4,552	-	1,845	-	1,080	-	13,362
king - - -	-	-	-	-	7,149	100	5,757	198	3,441	100	2,371	-	19,116
- - -	-	-	566	193	5,091	210	5,952	340	3,850	255	1,981	-	18,438
ncies - - -	831	195	2,423	137	5,897	155	7,829	160	1,873	143	1,104	-	20,747
g - - -	-	-	172	-	1,094	-	1,195	24	-	-	-	-	2,289
- - -	169	32	365	-	250	-	381	-	158	-	85	-	1,284
- - -	-	-	-	-	2,570	225	3,092	416	660	180	303	-	7,798
a of bark and g.	-	-	-	-	57	215	1,836	1,624	20	1,005	-	-	4,757
of ditto - -	-	-	-	-	-	-	708	54	-	49	-	-	811
and manuring	-	-	-	-	-	40	-	28	-	3	-	-	71
TOTAL - -	82,200	8,539	9,689	1,072	1,40,935	5,452	2,19,058	9,330	71,536	5,257	43,776	-	6,46,844

SANCTIONED ESTIMATE, Results of Expenditure, and Out-turn of the Government Chinchona Plantations for the Year 1872-73.

PARTICULARS.	Superintendent and Office Establishment.		Propagation and Nursery Department.		Dodabetta Plantation.		Neddiwuttum Plantation.		Pykara Plantation.		TOTAL Estimate.	TOTAL Expenditure.
	Estimate.	Expenditure.	Estimate.	Expenditure.	Estimate.	Expenditure.	Estimate.	Expenditure.	Estimate.	Expenditure.		
	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>
Establishment, including salaries - - -	8,012	8,127	210	240	1,620	1,620	3,132	3,132	1,020	1,020	14,024	14,139
Buildings - - -	-	185	200	43	300	195	300	330	200	53	1,000	806
Tool and store-rooms - - -	-	-	-	-	-	-	-	-	-	-	-	-
Coolies' quarters - - -	-	-	-	-	50	150	200	58	100	24	350	232
Felling - - -	-	-	-	-	-	-	-	-	300	-	300	-
Clearing and weeding - - -	-	-	-	459	2,500	2,420	3,811	2,712	2,500	1,960	7,811	7,551
Pitting - - -	-	-	-	-	50	70	50	140	100	199	200	409
Carriage of plants - - -	-	-	-	-	25	12	25	44	50	124	100	180
Planting and shading - - -	-	-	-	-	10	40	10	70	25	112	45	252
Road-making - - -	-	-	-	-	50	100	50	198	50	100	150	398
Tools - - -	-	-	-	193	100	210	150	340	100	255	350	998
Contingencies - - -	150	195	50	137	250	155	450	160	250	143	1,150	790
Clothing - - -	30	32	30	-	10	-	20	21	10	-	100	56
Various - - -	-	-	-	-	100	225	150	416	100	180	1,350	821
Collecting bark and mossing trees - - -	-	-	-	-	500	215	1,500	1,624	500	1,005	2,500	2,844
Carriage of ditto - - -	-	-	-	-	50	-	150	54	50	49	250	103
Manure and manuring trees - - -	-	-	-	-	-	40	-	28	-	3	-	71
TOTAL - - - Rs.	8,192	8,539	520	1,072	5,615	5,452	9,998	9,330	5,355	5,257	29,680	29,650

	<i>Rs.</i>	<i>a.</i>	<i>p.</i>		<i>£.</i>	<i>s.</i>
83,894 lbs. chinchona fresh bark supplied to Government Quinologist, at - - -	4	-	per lb.	- - -	20,973	8
25,000 " " dry bark for sale in England - - -	1	-	"	- - -	25,000	-
23 6½ " green tea-leaf distributed to the public - - -	1	4	"	- - -	191	11
9,200 chinchona plants " " - - -	2	-	each	- - -	95	13
25½ ounces chinchona seeds " " gratuitously - at - - -	4	-	per oz.	- - -	6	7
TOTAL - - - £.					46,270	-

CHINCHONA PLANTS permanently planted out, Dates of Planting, and Number of Acres by Base and Surface Measurement under Cultivation on the Government Plantations on the Nilgiris.

DATE.	Total Number of the Species of Chinchona Plants Planted.							Denison, Kilgraston, and Napier Estates, Neddiwuttum.						
	Crown Barks.	Red Barks.	Yellow Barks.	Grey Barks.	Other Species.	TOTAL.	Acres.	Crown Barks.	Red Barks.	Yellow Barks.	Grey Barks.	Other Species.	Acres, Surface.	Acres, Base.
1862-63 -	18,550	12,500	500	3,100	350	35,000	63	4,200	12,000	500	3,000	300	-	-
1863-64 -	20,432	7,700	1,000	2,500	-	31,632	55	16,000	4,700	1,000	1,500	-	-	-
1864-65 -	56,700	38,500	-	3,519	-	98,719	99	10,000	23,500	-	2,500	-	-	-
1865-66 -	45,500	34,020	-	-	-	79,520	80	2,000	22,720	-	-	-	-	-
1866-67 -	67,000	77,000	9,260	3,140	-	156,340	156	5,000	49,000	8,000	1,140	-	-	-
1867-68 -	150,701	163,800	9,600	14,000	1,600	339,701	340	15,000	94,800	6,200	9,000	-	-	-
1868-69 -	65,000	77,945	7,700	2,500	-	153,145	153	20,000	72,000	7,700	2,500	-	-	-
1869-70 -	84,995	168,473	-	-	899	254,367	254	3,550	70,680	-	-	-	-	-
1870-71 -	-	-	3,500	-	-	3,500	2	-	-	3,500	-	-	-	-
1871-72 -	-	-	2,350	-	1,900	4,250	5	-	-	2,350	-	-	-	-
1872-73 -	5,961	-	-	-	7,894	13,855	15	-	-	-	-	-	-	-
TOTAL - -	514,839	579,938	33,850	28,759	12,643	1,170,029	1,222	75,750	349,400	29,250	19,640	300	455	3712
									474,340					

CHINCHONA PLANTS permanently planted out, Dates of Planting, and Number of Acres by Base and Surface Measurement under Cultivation on the Government Plantations on the Nilgiris.

Dodabetta.							Wood and Hooker Estates, Pykara.						Stanley Estates, Malakoondah.				
Crown Barks.	Red Barks.	Yellow Barks.	Grey Barks.	Other Species.	Acres, Surface.	Acres, Base.	Crown Barks.	Red Barks.	Grey Barks.	Other Species.	Acres, Surface.	Acres, Base.	Crown Barks.	Red Barks.	Other Species.	Acres, Surface.	Acres, Base.
14,350	500	-	100	50	-	-	-	-	-	-	-	-	-	-	-	-	-
2,432	-	-	-	-	-	-	2,000	3,000	1,000	-	-	-	-	-	-	-	-
32,000	-	-	-	-	-	-	14,700	15,000	1,019	-	-	-	-	-	-	-	-
39,000	-	-	-	-	-	-	4,500	11,300	-	-	-	-	-	-	-	-	-
55,000	-	1,200	-	-	-	-	7,000	28,000	2,000	-	-	-	-	-	-	-	-
105,000	-	3,400	-	1,600	-	-	25,701	54,000	5,000	-	-	-	5,000	15,000	-	-	-
40,000	-	-	-	-	-	-	-	-	-	-	-	-	5,000	5,945	-	-	-
49,048	-	-	-	-	-	-	18,297	78,483	-	-	-	-	14,100	19,310	899	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	800	-	-	-	-	-	1,100	-	-	-	-	-	-	-
1,000	-	-	-	500	-	-	4,961	-	-	7,394	-	-	-	-	-	-	-
337,830	500	4,600	100	2,950	378	287.25	77,159	189,783	9,019	8,494	314	226.50	24,100	40,255	899	75	40.28
	345,980							284,455						65,254			

REGISTER of the Rainfall on the Government Chinchona Plantations at Nuddiwuttum for the Official Year 1872-73.

DATE.		Rainfall.	
		Inches.	Cents.
April	1872	1	67
May	"	3	39
June	"	20	12
July	"	31	71
August	"	19	34
September	"	13	2
October	"	5	31
November	"	3	71
December	"	2	19
January	1873	0	0
February	"	0	72
March	"	0	40
TOTAL		101	58

ORDER of the Madras Government thereon, 13 September 1873.

WITH the foregoing letter the Commissioner of the Nilgiri Hills submits the annual report of the Superintendent of the Government Chinchona Plantations. During the year 15 acres seem to have been planted out with 13,855 plants, making up the total number of trees in the plantations to 1,170,029. A large quantity of bark has been supplied to the Government Quinologist for the manufacture of amorphous quinine, and 25,000 lbs. have been forwarded to England for sale.

2. From the statements attached to the report, it appears that the total expenditure on the plantations up to the close of the past official year was a little under 65,000*l.*, and that the gross returns during the year under report are valued at a little over 4,600*l.*, which must be viewed as a fairly satisfactory result, considering the age of the trees.

3. The experimental abandonment of all expenditure on the Malakoondah Plantation does not promise to be successful, from Mr. McIvor's report of the state of the trees. The Commissioner will be good enough to take the matter into his consideration, and to report whether he would propose to incur a small annual outlay in order to clear the undergrowth.

4. It appears that the mossing process has not been carried out to the extent supposed, and that fully half of the oldest red-bark trees are unmossed. The remarks of the Superintendent and of the Commissioner on the superiority of the system are, however, out of place in an annual report of progress, and should be submitted in a separate communication.

5. The application of manure to the plants has been extensively carried out. As observed by Mr. McIvor, however, it will be difficult to arrive at accurate results, owing to the great variation in the samples of bark taken from trees apparently under precisely the same circumstances, but the experiment must be continued, and results carefully observed and recorded.

6. The cessation of high cultivation and the reduction of establishment, though resulting in a considerable diminution of expenditure, is stated to involve a sacrifice of efficiency. This matter should be specially brought forward for consideration as proposed by the Commissioner without delay.

— No. 32. —

(No. 34.—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Duke,

Ootacamund, 10 October 1873.

* See Page 54.

WITH our Despatch, 15th February 1872, No. 4,* paragraph 2, we forwarded a letter from Mr. McIvor, refuting the statement which was published in the Supplement to the "Gazette of India," dated 8th July 1871, to the effect that the chinchona plants, when originally supplied from the Nilgiris to Darjeeling, were affected with canker. Copy of our letter to the Government of India, asking that the same publicity might be given to Mr. McIvor's statement as was given to the unfavourable report above alluded to, was also sent with the same Despatch.

Proceedings of Government, 14 October 1872.

Proceedings of Government, 12 September 1873.

2. We now forward, for your Grace's information, our further proceedings on the subject, dated 14th October 1872, No. 1,418, and 12th September 1873, No. 978. The former embody a letter from the Government of India with papers from the Government of Bengal, maintaining the correctness of the assertion as to the existence of canker in the plants in question; and the latter contain letters from the Commissioner of the Nilgiris and from Mr. McIvor, being replies to the papers from the Government of India just referred to.

3. It appears to us that Mr. McIvor has shown that it is extremely improbable that canker existed in the plants originally sent up from the Nilgiris as stock for the Sikkim plantations, though it is possible that the disease may have been generated on the journey.

Proceedings of Government, 2 October 1873.

4. The letters from the Commissioner and from Mr. McIvor, referred to above in paragraph 2, have been forwarded to the Government of India, with the request that they may be published in the "Gazette of India" in continuation of previous correspondence.

We have, &c.
(signed) *Hobart, &c.*

Enclosure 1, in No. 32.

From the Secretary to the Government of India, Department of Agriculture, Revenue, and Commerce (Agriculture and Horticulture), to the Secretary to the Government of Madras; dated Simla, 1st October 1872.

I AM directed to acknowledge the receipt of your letter No. 73, dated 11th January 1872, and in reply to forward, for the information of his Excellency the Governor in Council, copy of a letter* from the Government of Bengal (with enclosures), which, in the opinion of the Government of India, leaves little doubt of the correctness of the assertion that canker "is shown to have existed in the plants originally sent up from the Nilgiris as stock for the Sikkim plantations."

* No. 3,096, dated 6th ultimo.

2. Your letter, together with the reply of the Government of Bengal, with the enclosures of both, will now be published in the Supplement to the "Gazette of India." Paragraphs 3 and 4 of the late Mr. Brecks's letter to your address, No. 91, dated 13th December 1871, will however be omitted, as they appear to the Governor General in Council to be objectionable, as embodying a personal attack upon a Secretary to Government, based on a statement contained in a letter signed by him in his official capacity.

From the Superintendent, Botanic Garden, and in charge of Chinchona cultivation in Bengal, to the Officiating Under Secretary to the Government of Bengal; dated Royal Botanic Garden, 12th July 1872.

WITH reference to your memorandum marginally noted, calling for a report on the statements made by Mr. McIvor impugning the correctness of the evidence given by Mr. Munro as to the importation of cankered chinchona plants from the Nilgiris, I have the honour to state that I have collected fresh evidence on the point from all the persons known to me now in India who were connected with the first chinchona experiments in Sikkim.

12 April 1872, with enclosures.

2. I have now the honour herewith to forward, for the information of Government, copies of the statements of the following gentlemen:—

(I.)—Dr. B. Simpson, Civil Surgeon of Patna, and formerly of Darjeeling. Dr. Simpson was interested in the Pomong plantation on its first being started, and consequently writes from personal knowledge.

(II.)—Mr. Munro, manager of the Pomong plantation.

(III.)—Mr. Jaffrey, of the Government Chinchona plantation. Mr. Jaffrey has been continuously on the Government plantation since its commencement until now.

(IV.)—Mr. Gammie, resident manager, Government Chinchona plantation.

(V.)—Mr. Scott, curator, Botanic Garden. Mr. Scott originally served on the the Government Chinchona plantation, but was subsequently transferred to his present appointment.

3. In compliance with Mr. Geoghegan's letter marginally noted, I have the honour to submit some remarks on the several matters touched upon in Mr. McIvor's letter to Commissioner of Nilgiris, dated 6th December 1871.

From J. Geoghegan, Esq., to H. Plowden, Esq., dated 6th April 1872.

4. In the evidence taken by the Chinchona Commission during March 1871 no particulars are recorded in regard to the introduction of canker to the Government plantation, none of the witnesses apparently having been questioned on the point. Mr. Munro's statement (page 21, paragraph 41, 4th clause), that his Association received its first cuttings from the Nilgiris, and that "these were extensively affected with canker," is the only one in which the importation of the disease into Sikkim is specially referred to. From his letter above quoted, it appears Mr. McIvor is not inclined to admit that any plants sent by him from the Nilgiri plantations to Sikkim for either the Government plantation or that of the Chinchona Association could, on arrival in Sikkim, have been affected with the disease which he calls "canker."

Report of the Chinchona Commission, dated 30 March 1871.

5. As regards the Government Sikkim plantations, Mr. McIvor thinks it improbable (paragraph 2 of his letter) that if cankered plants were received the fact should not have been mentioned until the year 1871. Mr. McIvor's argument is a negative one, and his numerous extracts from the reports of the late Dr. Anderson, while proving that in Dr. Anderson's opinion the success of the Chinchona cultivation under him had been great, do not prove that it had been attended by no drawbacks whatever. Had Dr. Anderson

considered

considered the so-called canker such a formidable affection as Mr. McIvor does, he would have doubtless referred to it in his reports. From his not having done so, the natural inference is that he did not think it worth mentioning, and that, on the whole, he considered himself warranted in regarding the Chinchona experiment in Sikkim as a success—a view which is, I believe, shared by most people who have seen the plantations there. Now, however, that the question as to the introduction of canker has been definitely raised, the evidence goes to show that, as a fact, the plants brought from the Nilgiris were on arrival, or very soon thereafter, found to be affected with it. Mr. Jaffrey (in paragraph 2 of his evidence) positively states that the 327 plants received by Government in April 1863 from the Nilgiris were cankered (these are the plants referred to in Mr. McIvor's paragraph 10), and that those received by him in August 1862 were also diseased. Dr. Simpson corroborates Mr. Jaffrey's statement in so far when he says that he saw the disease in the plants in pots under glass at Lebong before a single one had been planted out. Messrs. Scott and Gammie, who joined the Chinchona establishment subsequently to the importation from the Nilgiris, bear testimony to the fact that prior to their arrival canker had been established among the plants. It is therefore quite clear that it did not appear suddenly and for the first time as a widespread epidemic shortly anterior to the visit of the Commission in February 1871.

6. As regards the private plantations in Sikkim, Mr. Munro states that his association got its first cuttings from the Nilgiris, and that these were "extensively affected with canker." Mr. McIvor argues that Mr. Munro's evidence is inadmissible, because he says "it is quite certain from a careful examination of the records that Mr. Munro never received any cuttings from the Nilgiris." Mr. Munro, on the contrary, states (paragraph 3 of his memorandum) that early in 1864, and a few months after his own arrival in Sikkim, four wardian cases of chinchona plants were received from the Nilgiris, and that these were the plants described by him in his evidence before the Commission as "extensively affected with canker." Mr. Lloyd, who succeeded Dr. Bourne as secretary to the association, of which Mr. Munro is the manager, corroborates this by explaining how much these plants cost. The evidence concerning this importation is very clear, dates of dispatch and arrival of the cases and of the remittance of the money in payment being given. Mr. Lloyd further shows that prior to this payment 500 rupees had been remitted to Mr. McIvor for plants, of which Mr. Munro says (paragraph 4) only seven were survivors at the date of his arrival in Sikkim. Dr. Simpson bears testimony to Mr. Munro's general accuracy, and himself describes the condition of the first importation from the Nilgiris; while, in paragraph 3 of his memorandum, Mr. Jaffrey states that he was consulted during the year 1863 by Mr. Barnes, one of the original partners in the Chinchona Association, as to the diseased condition of some plants received from the Nilgiris.

7. In paragraph 4 of his letter Mr. McIvor points out an "error" of omission into which, he says, Mr. Munro has fallen in his evidence before the Commission, and, by way of rectifying Mr. Munro's omission, states that the Chinchona Association was supplied by him with seeds enough of Chinchona to have produced "probably from 50,000 to 100,000 seedlings." Mr. Munro, in paragraph 5 of his memorandum, states that the amount of seed (a quarter of an ounce) was sufficient on McIvor's own showing to have produced only from 5,000 to 6,250 plants. Mr. Munro has thus, I think, very conclusively disproved both the charges of inaccuracy brought against him by Mr. McIvor.

8. A few statements in Mr. McIvor's letter which bear, not on the introduction of canker, but on its effects in Sikkim, remain to be noticed. In paragraph 7 of his letter he says, "the entire stock of this species (*Cinchona Officinalis*) has been so seriously affected with canker as to cause its cultivation to be abandoned." I have elsewhere stated at length the causes of the abandonment of the cultivation of *Cinchona Officinalis*, and would here only draw attention to paragraph 4 of Mr. Gammie's, to paragraph 5 of Mr. Jaffrey's, and to paragraph 7 of Mr. Munro's memoranda, in which these gentlemen distinctly state that canker was *not* the cause of its failure.

9. In the paragraph of his letter just referred to Mr. McIvor goes on to say that "the Sikkim stock of *C. Pahudiana* raised solely from Java plants has also been destroyed by canker." I am rather surprised to find this statement made by Mr. McIvor, for everybody interested in Chinchona cultivation ought to know that this species, after having been extensively cultivated in Java, was discovered to yield *no quinine*, and that for this reason its cultivation was everywhere abandoned. Messrs. Munro and Jaffrey note this fact in their memoranda.

10. A third mistake into which Mr. McIvor has fallen in this same paragraph 7 is that of saying that "the Java variety of *C. Calisaya* (*C. Josephiana*) has been so affected by canker that only one plant existed on the Sikkim plantation at the date of my visit in February 1871 out of all the plants received of this variety;" whereas Mr. Gammie, in the concluding paragraph of his memorandum, estimates the number at 8,000.

11. In my last annual report I have given my own opinions on the disease existing in the Sikkim plantations, and have distinguished two forms of it, one general and one local. The latter I regard as anything but fatal, and I would here merely allude to the instructive instance of recovery mentioned by Mr. Gammie in the concluding part of paragraph

See McIvor on
Propagation of
Medicinal Chinchonas,
page 6,
paragraph 12.

Report on Chinchona
Plantations,
Sikkim, for year
ending 31st March
1872.

Graph 1 of his statement. I may mention that I saw examples of both forms of the disease in the Chinchona plantations on the Nilgiris during my recent visit to them, although neither is common there.

I.—DR. SIMPSON.

My dear King,

Bankipore, 25 June 1872.

MR. McIVOR is wrong in stating that Mr. Munro received no cuttings from the Nilgiris. It is quite true that the first instalment of plants were sent long before his arrival, but when they were opened in my presence at Lebong only one plant in the box was alive, and even this subsequently died. I also corroborate Mr. Munro's statement regarding the disease in the plants. Moreover, before Mr. Munro arrived in the country at all, and before a single plant belonging to Government was planted out, I saw the disease at Lebong in the glass-house, while the plants were in pots (I allude here to the Government plants). Mr. Jaffrey, who was then in charge, can bear enough testimony to this. From my personal knowledge of Mr. Munro, even were I unacquainted myself with the actual state of matters, I would place the fullest confidence in any statement put forth by him.

Yours, &c.

(signed) B. Simpson.

II.—MR. MUNRO.

MEMORANDUM by J. Munro, Esq., Manager, Darjeeling Chinchona Association, Pomong.

REFERRING to letter No. 115, of the 6th December 1871, from Mr. McIvor, Superintendent, Government Chinchona Plantation, to the Commissioner of the Nilgiris, with enclosures.

1. From Mr. McIvor's letter I see that he calls in question the statements made by me before the Bengal Chinchona Commission at Rungbee in February 1871, and flatly denies that the Darjeeling Chinchona Association received any plants from the Nilgiris in my time, and asserts that the last supply of plants from the Nilgiris was ten months in Bengal before my arrival there.

2. My reply will be as short as possible.

3. At paragraph 3 of his letter Mr. McIvor says:—"It is quite certain from a careful examination of the records that Mr. Munro never received any cuttings from the Nilgiris. In fact, Mr. Munro did not arrive at Pomong until December 1863, or when the original plants sent from the Nilgiris as stock for the Sikkim plantations had been nearly two years, and the last supply fully ten months, in Bengal." Mr. McIvor is quite correct as to the time of my arrival. I arrived in Darjeeling on the 11th of December 1863. I do not know what records Mr. McIvor had examined so carefully, but I would respectfully suggest that he examine his own account-books (I presume he keeps books), and if he does not find there that he despatched four wardian cases of Chinchona plants to Bengal in the beginning of 1864, and that he was paid for the same in June 1864, all I can say is that such entries ought to be there.

For it is quite certain that the Darjeeling Chinchona Association did get four wardian cases containing Chinchona plants, labelled *C. Succirubra*, *C. Micrantha*, and *C. Condaminea*, from the Nilgiris, and that they arrived in Darjeeling on the 3rd of March 1864, or two months and a half after my arrival there. I also got four wardian cases from Ceylon at the same time, containing principally *C. Succirubra* and a few plants of *C. Officinalis*, very different plants from the Madras plants. As Mr. McIvor might again call in question my unsupported evidence, I enclose herewith a note from our present Secretary* of the different payments made to Mr. McIvor for plants, which speaks for itself. Those plants which arrived in Darjeeling on the 3rd of March, and for which Mr. McIvor was paid 256 rupees on the 30th June 1864, were the plants referred to by me in my evidence before the Chinchona Commission, quoted by Mr. McIvor in paragraph 1 of his letter.

4. That statement, I repeat, is substantially correct, and was made by me in support of my views on canker, and not with any view or intention of detracting anything from the glories of the Nilgiris or their able superintendent; nor was I aware (until Mr. Broughton, a member of the Commission, indignantly denied it) that the existence of canker there was denied. Indeed, I was then, as I still am, under the impression that Mr. McIvor, during his short visit to Pomong, and in answer to a direct question from me, admitted that they had canker to a limited extent. I am also under the impression that it occurs

in their native country; but, be that as it may, certain it is that the Madras plants which reached me on the 3rd March 1864 (of the first consignments I know nothing, having only arrived in time to see the death of the last of them, seven plants), and which were very stunted, having been used as *stock plants* before they were despatched, as the frequent marks of the knife on them fully testified, showed symptoms of the disease we have since learned to call canker, as soon as it could be distinguished from injuries received on the journey. The Ceylon plants were long succulent shoots that had never been topped.

I do not affirm that they were afterwards free of canker.

5. At paragraph 4, Mr. McIvor quotes another statement made by me before the Chinchona Commission, namely, "that my present plantation of 500,000 plants of *C. Succirubra* were raised by cuttings from 92 plants," and says "this is an error, as I supplied a quantity of excellent seeds to the proprietors of the Pomong plantations, Mr. Lloyd and Colonel Angus. These seeds germinated freely, and probably produced 50,000 to 100,000 plants."

This statement, which I have no doubt is quoted correctly, is not very happy in its wording, and ought to be "at least 500,000 plants of *C. Succirubra* now in permanent plantations were raised by cuttings (including layers, eyes, &c., &c.) from 96 (not 92) plants." But this does not alter its meaning in the least for the purpose for which it was made, namely, to point out to the Commission the effect such treatment must of necessity have on weakening the constitution of a forest tree—an effect from which they very soon recover, however, when placed in a favourable situation.

6. The above would scarcely be worth noticing, but that Mr. McIvor tries to damage the whole of my evidence by making some of my statements appear false. My monthly returns will show any whom it may concern the number of plants, cuttings, &c. from the beginning to date.

My return for December 1870, or previous to the sitting of the Commission, shows as follows:—

<i>C. Succirubra</i> plants in permanent plantations	-	-	867,400
Ditto - - ditto in nursery beds for ditto.	-	-	667,331
Ditto - - ditto in stock - - - - -	-	-	15,000
Total - - -	-	-	1,549,731

So that my statement in round numbers of 500,000 was considerably within the mark, and left ample room for a good deal more than Mr. McIvor's seeds, even at his own estimate of them. The produce of his seeds, as soon as they were ready, were planted out with others in 1870. And I hope Mr. McIvor will not doubt my word when I say that I tried to the utmost of my poor abilities and the rude means at my disposal to make the most of them, but I think he is rather hard on me in his estimate of the number of plants I ought to have raised from them. He takes care not to mention the quantity of seeds sent; I will do so for him: it was of *C. Succirubra* $\frac{1}{4}$ oz.; and Mr. McIvor, in his "Notes on the Propagation and Cultivation of the Medicinal Chinchonas," published in 1867, page 6, paragraph 12, says "one ounce of clean seeds produce on an average from 20,000 to 25,000 plants," so that "instead of from 50,000 to 100,000" his $\frac{1}{4}$ oz. would produce from 5,000 to 6,250 plants only.

7. The remainder of Mr. McIvor's letter refers principally to the Government plantations, and does not concern me much; but as I have a few plants here of *C. Officinalis* and its varieties, and of *C. Pahudiana*, I may remark with reference to Mr. McIvor's statements at paragraph 7 of his letter. After stating that the principal stock of *C. Officinalis* had been raised from seeds from Ceylon, he says: "And it is worthy of note that the entire stock of this species has been so seriously affected with canker as to cause the cultivation to be abandoned. The Sikkim stock of *C. Pahudiana*, raised solely from Java plants and seeds, has also been destroyed by canker." This is a bold assertion, and it is certainly new information to me that the one was abandoned *through*, or the other destroyed *by*, canker; but as I presume he refers to the Government plants, I leave the gentleman in charge of them to digest it. We have a small patch of each species here, as also of *C. Micrantha*, the latter raised solely from Madras plants; we discontinued propagating the whole of them from a very early stage, not because of *canker* (which is only a mare's-nest discovered by Mr. McIvor), or because of any other disease, but simply because of their prospects from a commercial point of view. They are not destroyed, but are not worth wasting money on, and the climate of Sikkim does not appear to be very suitable to either of them. They are not the only species, however, that Mr. McIvor has forbidden to grow in Sikkim; if I am rightly informed (I write from hearsay), he in one sublime sentence pronounced the whole of our *Succirubra* to be dying out also, and gave them three years to take themselves out of existence, Pomong I suppose included. Such a statement made by any man after seeing the *Succirubra* plantations here simply deserves contempt.

8. To prevent any confusion between the Government and private plantations by the
term

term "the Sikkim plantations" used by Mr. McIvor, I beg to say that my remarks in the foregoing, as well as before the Chinchona Commission, refer to the plants under my own charge only. The Government officers are perfectly competent to answer for themselves and their plants.

9. In conclusion, I would most respectfully observe that I make no claim or pretension to Mr. McIvor's ability or experience. He has more experience in his profession in general, considerably more so in India, and three years more in Chinchona cultivation than I have.

All I contend for is the truth of my statements, which I think I have sufficiently proved; and as Mr. McIvor's statement at paragraph 3 of his letter is calculated to do me injury, I will consider it only an act of justice on the part of Government to give the same publicity to this as they did to Mr. McIvor's statements, and I consider myself entitled to an apology from that gentleman for his rash and unwarranted statements.

Darjeeling Chinchona Association,
3 July 1872.

Dear Sir,

You ask me if there are no entries of money paid to Mr. McIvor for Chinchona plants. I have looked, and find the following:—

30th June 1864.

To Mr. McIvor of Madras.								Rs.	a.	p.
Purchase of plants	-	-	-	-	-	-	-	256	-	-
Inland carriage	-	-	-	-	-	-	-	8	12	-
Freight	-	-	-	-	-	-	-	40	-	-
Total								304	12	-

30th April 1863.

To amount remitted to Mr. McIvor for plants - 100 - -

31st May 1863.

To amount remitted to Mr. McIvor for plants - 200 - -

30th June 1862.

To amount remitted to Mr. McIvor for plants - 200 - -

There are also references in the minutes and other proceedings and complaints against Mr. McIvor for the bad plants he had sent from Ooty.

J. Munro, Esq., Superintendent.

Yours, &c.
(signed) W. Lloyd,
Darjeeling Chinchona Association.

III.—MR. JAFFREY.

MEMORANDUM on Chinchona Canker in British Sikkim.

I TOOK charge of the Government *Chinchona* at Sinchul in August 1862. Found a disease in *Cinchona succirubra*, but from its peculiar type was some time before coming to the conclusion that it was canker.

2. I received during April 1863, 327 plants, consisting of various species of *Chinchona* from the Nilgiris, amongst which canker was fully developed.

3. Was, during 1863 consulted by the late Charles Barnes, Esq., of the Darjeeling Chinchona Association, with reference to a consignment of *Chinchonas* received from the Nilgiris. Observed in the wardian cases seven or eight sickly specimens; attributed the destruction of the plants at the time to their weakness, and the wretched soil in which they had been transmitted.

4. *Chinchona Pahudiana*.—Cultivation was stopped by order of Government, it being considered a useless species; 1,000 plants were killed, on the morning of the 16th January 1864, by frost. A small plantation of this species has been retained, so that it should not be lost. The plants are from 15 to 19 feet in height at this time (1st July 1872); canker has nothing to do with the disappearance of this species.

5. *Chinchona Officinalis*.—Cultivation has been held in check in consequence of the climate of Rungbee having been found unsuitable to their wants; canker in this species has been the exception, not the rule.

6. *Chinchona Calisaya*, var. *Josephiana*.—I am not aware of having received by name at any time this variety of chinchona. I received eight plants of *C. Calisaya* at Sinchul in 1862, and named as such. I recollect pointing out to the late Dr. Anderson a few strong plants amongst the seedlings of Java *C. Pahudiana* as being botanically like the variety *Josephiana*.

Government Chinchona Cultivation.

A. T. Jaffrey.

IV.—MR. GAMMIE.

From the Resident Manager, Government Chinchona Plantation, Rungbee, to the Superintendent, Botanical Gardens, and in charge of Chinchona Cultivation in Bengal; dated Mongpoo, 5th July 1872.

IN forwarding the remarks of Messrs. Jaffrey and Munro on the introduction of canker to British Sikkim, I beg to state that I can say nothing on the subject from personal experience, as I did not arrive in India till December 1865. I have every reason to believe that canker showed itself in the plants immediately after their arrival from Madras, but at the same time I think that, even had quite healthy plants been received, there would have been more or less canker in the Sikkim plantations, but that it is not a disease to cause alarm, for it very seldom kills the plants. As a case in point, I may mention that Mr. McIvor, when at Rungbee, wished to pull up a plant of *C. Calisaya*, which he said had been killed by canker, for the purpose of showing the Chinchona Commission the deadly effects of the disease as had been previously expounded by him. Mr. Clarke, the Officiating Superintendent, would not allow him to do so, as he denied it was dead, and wished to see whether he or Mr. McIvor was right. Mr. Clarke gave him permission to pull up any other canker-stricken plant he chose, but, to the best of my recollection, Mr. McIvor did not act on the permission. This particular plant is alive to this day, and will probably live for many years to come.

2. As Mr. Mann is absent on leave, and has not the opportunity of defending himself, I beg leave to state that Mr. McIvor has, in my opinion, misunderstood the statement made by Mr. Mann, that "ten per cent. were old exhausted plants from the Nilgiris." Mr. Mann, in my opinion, meant that they had been exhausted by constantly being cut for propagation here, and not that exhausted plants had been sent from the Nilgiris.

3. I am surprised at Mr. McIvor coming to the conclusion that "it appears to be assumed that the Sikkim plantations were stocked with plants from the Nilgiris only," for the receipt of seeds (from whatever source) and the results were generally published in the Chinchona reports, as he himself partly shows.

4. Mr. McIvor is quite mistaken in his conclusion that the cultivation of *C. Officinalis* was abandoned on account of canker, and that *C. Pahudiana* was destroyed by the same disease. *C. Officinalis* certainly died out, but from the root, and not from what I understand to be canker, which affects the bark and not the root.

5. I am not aware where Mr. McIvor got his information "that only one plant of the Java stock of *Calisaya* was in existence at the time of his visit to Sikkim in 1871," but certainly it was not from a reliable source, for the original Java stock was not kept separate from the stock received from other places, and it is quite impossible for any one to tell with certainty the origin of all the plants. However, at the time of Mr. McIvor's visit, there were in permanent plantations not fewer than 8,000 plants raised from Java seeds.

V.—MR. SCOTT.

MEMORANDUM by *J. Scott, Esq.*, Curator, Royal Botanical Garden, Calcutta.

I ONLY joined the Government Chinchona nurseries in Sikkim, then at Lebong, about the end of December 1864. The so-called canker had infected the plants ere that, and was indeed equally as prevalent as I ever after saw it amongst the plants in the frames or nurseries at Rungbee. I am thus unable to say whether or not the plants originally received from the Nilgiris were infected with that disease. Even supposing, however, that the plants were perfectly free from the disease when lifted and dispatched in the wardian cases from the Nilgiris for Sikkim, I am quite of opinion that it might have originated during the journey if the plants were kept in a wet soil, and a close, hot, and moist atmosphere. I do not think that the disease is at all infectious, or has any fungoid origin, but I consider it simply due to excess of moisture in the soil and atmosphere.

From the Officiating Superintendent, Botanical Garden, and in charge of Chinchona Cultivation in Bengal, to the Officiating Secretary to the Government of Bengal, General Department; dated Royal Botanical Garden, 8th August 1872, No. 363.

WITH reference to Dr. King's report, No. 360, of the 12th July 1872, on the introduction of the Chinchona bark disease, I have the honour to inform you that subsequent to the submission of that report, Mr. Davidson (lately an assistant to Mr. Broughton, Quinologist to the Madras Government), called on Dr. King, and in the course of conversation he incidentally noticed the occurrence of canker on the Nilgiri Chinchonas. Dr. King was thus induced to ask Mr. Davidson for a memorandum on the condition of the Government Chinchona plantations there as regards that disease. I now beg to submit a copy of Mr. Davidson's memorandum (received this day), which I may remark is strongly confirmative of Mr. Munro's statement to the Chinchona Commission, "that canker was imported into the Chinchona plantations, Sikkim, from those on the Nilgiris."

2. "With reference to canker," says Mr. Davidson, "in the Government Chinchona estates at Neddiwuttum, I may state that I have never paid very close attention to the subject, so my information may be rather scanty; but what I can give I believe to be strictly correct. One form of disease that I have observed seems to be confined to the lower portion of the tree; the bark just above the surface of the soil cracks, the cracks, I think, generally radiating from a common centre; the wood under the cracked part rots, the rotting going deeper until it reaches the pith; if the rotten wood is closely examined, it will be found to contain a minute fungi, similar in appearance to ordinary mould. The second form is when the bark dries (but does not crack); sometimes in patches along the trunk, sometimes up one entire side of the tree. I believe Mr. McIvor always makes it a point to have all trees suffering from either form cut down on the first appearance of their flagging. This is about all the information I can give you on the subject.

Enclosure 2, in No. 32.

From the Commissioner of the Nilgiris to the Acting Secretary to Government, Revenue Department; dated Ootacamund, 19th July 1873.

I HAVE the honour to enclose a letter from Mr. McIvor, in reply to Government Order, dated 14th October 1872, No. 1,418.

2. Mr. McIvor submits that the Nilgiri plantations have proved themselves so singularly free from canker that it is unlikely 327 Chinchona plants, exported for the Sikkim plantations, were on exportation affected with the disease, more especially as every precaution was taken to send away healthy plants, and the plants were chosen by skilled persons despatched from Bengal to select them.

3. From the same circumstance of the healthiness of the Nilgiri plantations, Mr. McIvor submits that other plants despatched must, in all probability, have been equally free from disease.

4. Mr. McIvor further submits that the written evidence recorded at the time shows all the Nilgiri plants to which it refers were healthy, and that it is only ten years afterwards that their freedom from disease on quitting the Nilgiris is called in question, and then, upon the recollection of gentlemen interested in the propagation of the plants in Bengal.

5. Finally, Mr. McIvor defends himself against the imputations of inaccuracy brought against him by the witnesses on whom Dr. King relies, and submits that the witnesses have fallen into error in every instance they cite.

From the Superintendent of the Government Chinchona Plantations to the Commissioner of the Nilgiris; dated Ootacamund, 12th July 1873.

I HAVE the honour to acknowledge Government Official Memorandum, Revenue Department, No. 97, dated 7th of May. last, desiring to know whether I have any remarks to make on a letter of the Government of India, recorded in General Order, dated 14th October 1872, No. 1,418, in which the Government of India arrive at the conclusion that "canker is shown to have existed in the plants originally sent up from the Nilgiris as stock for the Sikkim plantations."

2. The Government of India form this decision upon an inquiry conducted by Dr. King, Superintendent of the Chinchona Cultivation in Bengal. Dr. King encloses in his report the evidence upon which he bases his judgment.

3. I shall venture first to remark upon Dr. King's arguments and summing-up, and will then cursorily meet the adverse statements in the evidence he adduces.

4. Dr. King remarks, in paragraph 4 of his letter: "It appears Mr. McIvor is not inclined to admit that any plants sent by him from the Nilgiri plantations to Sikkim, for either the Government plantation or that of the Chinchona Association, could, on arrival in Sikkim, have been affected with the disease which he calls canker." I beg to submit that my position as thus described by Dr. King is not the position I have adopted, and which I maintain. My position is not that the plants when received at Sikkim were not tainted with canker, but that there was no taint on the plants when they quitted the Nilgiris. I can only argue on the condition of the plants as they left my hands. Obviously I can know nothing of the condition in which they reached the Himalaya Mountains. The distinction is of the utmost importance. My argument is that the plants left the Nilgiris free from disease, and that if they reached the Himalayas (as it is now stated they did) with canker, they contracted the malady on the road.

5. I will proceed to show how probable it is that such a state of things occurred. I must first, however, meet the argument of Dr. King in paragraph 5 of his letter to the effect that argument from probability is negative argument. I oppose to this objection that Dr. King, while condemning a negative argument in me, is driven to a negative argument himself. In paragraph 4 of his letter, he admits that Dr. Anderson did not, as a matter of fact, mention in any of his reports the existence of canker in the Nilgiri plants; and he accounts for his silence by the negative argument that Dr. Anderson probably "did not think it (canker) worth mentioning." This argument of Dr. King even goes beyond the point of mere negation; for Dr. Anderson does not merely pass over the existence of canker in the Nilgiri plants, and so leave it to be inferred the possibility of the existence of canker, but he states, at paragraph 6 of his letter, dated 11th February 1862, which was written from Calcutta after the arrival of the Nilgiri plants there, that the plants were "as healthy as they were at Ootacamund." At paragraph 2 of the same communication, speaking of the plants on the Nilgiris, he says: "Under such favourable circumstances the plants receive at once every condition necessary to their perfect health." In fact, all Dr. Anderson's reports of the Nilgiri plants not only make no mention of canker, but positively say the plants come from a healthy source, and are healthy. The matter stands thus: speaking of circumstances ten years after the event, which cannot be decided on evidence recorded at the time, Dr. King and I are both driven to negative arguments. I submit that, from the nature of the case, only negative arguments are possible.

6. Following this train of argument I shall, as I hope, demonstrate—

1st. That it is extremely unlikely the plants from the Nilgiris were affected with canker when they left the Nilgiris.

2nd. That it is, on the other hand, highly probable that the plants spontaneously generated canker on their journey to Sikkim.

7. Upon the first point it is only necessary to say that Dr. King, in his letter under discussion, admits, at paragraph 11, the infrequency of canker on the Nilgiris. He says: "I saw examples of both forms of disease in the Chinchona plantations on the Nilgiris during my recent visit to them, although neither is common there;" and to add that on the Nilgiris the Government plantations cover 1,200 acres, and only 600 cankered trees have been discovered since the commencement. I refer also to paragraph 2 of Dr. Anderson's letter quoted above, and to the fact, well known to physiologists, from the late eminent Mr. Knight downwards, that canker, even if introduced to a climate unfavourable to its diffusion, is arrested. The fact of canker never having gained a footing on the Nilgiris shows the Nilgiris possesses such a climate, and the inevitable inference appears to be that the plants did not leave the Nilgiris cankered.

8. The next point requires me, in the first instance, to demonstrate the nature of canker, and the conclusion that it might probably have been spontaneously generated between the date the plants left the Nilgiris and their arrival at Sikkim.

9. Upon

9. Upon the nature of canker it is stated in "Loudon's Suburban Horticulturist," chapter VI., page 123, and "Lindley's Gardeners' Chronicle" page 283, 2nd May 1846, canker is a disease caused by "unsuitableness of soil, unpropitiousness of climate, and want of access of air." The disease disappears when these conditions are changed. Mr. Scott, in his evidence before the Chinchona Commission, allows this; for he says, in reply to a question, "Would you willingly propagate from a cankered stock-plant?" "As readily as from a healthy plant, provided I could find a healthy shoot to make a cutting of." The answer shows that, in his opinion, Mr. Scott could get rid of canker by judicious treatment; for it is clear that if the healthy shoot from a cankered plant was placed in unfavourable conditions, it would continue to develop disease.

10. But hypothesis is not needed in the matter, as we have positive proof that canker arises from damp in wardian cases. The whole of the plants conveyed to Java from South America in 20 wardian cases by Dr. Hasskarl were so affected with disease that, as stated by Dr. McPherson to the Madras Government, dated 19th December 1860, paragraph 8, "most of the young trees on being planted out speedily died, and of all the trees imported only two survived." With some of the consignments sent to India from South America the loss was even more complete. The whole stock of *Calisaya* collected by Mr. Markham perished from confinement in wardian cases. The entire collection of Mr. Pritchett similarly perished before arrival in Bombay, and the only plants which survived long confinement in cases were those brought by Mr. Cross to Madras. These plants survived, because Mr. Cross kept the cases open, and daily forked up the earth about the roots. From these latter plants the Nilgiri stock was raised.

11. The opinion of Mr. Scott accords with these facts. Mr. Scott says, in the correspondence under reference: "Even supposing, however, that the plants were perfectly free from the disease when lifted out and despatched in wardian cases from the Nilgiris for Sikkim, I am quite of opinion that it might have originated during the journey, if the plants were kept in a wet soil and a close, hot, and moist atmosphere."

12. Thus it is shown positively that canker appears in wardian cases. And what was the treatment the Nilgiri plants received on the journey to Sikkim? Upon this point Dr. Anderson, in his report from the 1st April 1862 to 30th April 1863, writes: "That owing to the highly unfavourable circumstances in which the plants were placed after their arrival in Darjeeling, I was obliged to keep the Chinchona plants confined for two months in wardian cases, some of them having been already subjected to five months of this confinement." Further, Dr. Anderson writes: "No packages of any kind ever reached Darjeeling from Calcutta in less than six weeks, the usual time occupied in the transit being two months." In fine, Dr. Anderson proves to demonstration that the time all plants passed in wardian cases in their journey from the Nilgiris to the Himalayas was invariably sufficient to generate canker.

13. I have, in my report on the Sikkim plantations, stated my opinion that the climate of Sikkim is favourable to the development of canker. Even, therefore, if the extreme supposition was adopted that the Nilgiri plants escaped the peril of the journey to Sikkim, on their arrival they would have been placed in conditions adverse to health. The climate of Sikkim is condemned for Chinchona by Mr. Gammie, who writes, in paragraph 1 of his letter, Enclosure 4 in the letter of the Government of India: "I have every reason to believe that canker showed itself in the plants immediately after their arrival from Madras; but, at the same time, I think had even quite healthy plants been received, there would have been more or less canker in the Sikkim plantations."

14. The climate of Rungbee is much like the climate of the Travancore States, and is, I believe, too moist for Chinchona. I had the honour to report on the Travancore Government Chinchona Plantations in September 1872. I found the trees there permeated with canker. I am informed that they have now actually died out, and it is the intention to plant coffee on the sites. It will be seen in this report, and I beg to draw attention to the fact that I show there, that canker is a disease not only of the bark of Chinchona, but which attacks the roots also. From the correspondence now under reference, it seems that the Bengal authorities are under a misapprehension, and refer canker only to bark-disease.

15. I have thus endeavoured to show—

1st. That it is not probable the plants should have had canker when they left the Nilgiris, as they were forwarded from a pure source;

2nd. That nothing was easier than for them to contract the disease during their journey to Sikkim; and,

3rd. That, in the extreme supposition that they escaped the peril of the journey, Sikkim has a climate and soil described by the most eminent physiologists as presenting conditions favourable to the origination of canker.

16. I will now address myself to minor points, and to the inaccuracies ascribed to me by the witnesses cited by Dr. King.

17. Stress is laid by Dr. King on the evidence of Mr. Jaffrey, who, Dr. King states, has been on the Government plantation since its commencement. This is an error. Mr. Stubbs was originally in charge. Mr. Jaffrey took charge on the 13th of September 1862,

or nine months afterwards. The statement is made at paragraph 2 of Dr. Anderson's report, 1862-63. Thus Mr. Jaffrey had no means of knowing the state of the original stock of plants until nine months after they had been submitted to the adverse climate of Sikkim.

18. In his evidence, referred to by Dr. King, it is stated by Mr. Jaffrey: "I received, during April 1863, 327 plants from the Nilgiris, amongst which canker was fully developed." It is worthy of remark that Mr. Jaffrey made no mention of so important a fact until 1872, and withheld it in his evidence before the Chinchona Commission in 1871. The following are the facts with regard to these 327 plants:—Dr. Anderson sent down a European gardener and a mallee from Calcutta to select and pack them; he writes on the 9th March 1863, to the late Sir W. Denison, then Governor of Madras: "You will probably like to hear that the Chinchona plants supplied to me from Ootacamund arrived here in excellent condition, and are still in this garden (Botanic, Calcutta), and have grown much, most of them having made three pairs of leaves since their arrival here." Referring to these plants after their arrival in Darjeeling, he writes: "Of the original number (350) received from Madras, only 23 had been lost between Calcutta and Darjeeling."

19. Referring to plants subsequently received by the Darjeeling Chinchona Association, Mr. Jaffrey, at paragraph 3 of his present letter, attributes their destruction "to their weakness and the wretched soil in which they had been transmitted." It may be permitted me to remark on the singularity of the circumstance, that taking the 327 plants received in April 1863 to have been affected with canker immediately recognisable by Mr. Jaffrey, and not to have been, as Mr. Anderson stated, quite healthy, Mr. Jaffrey could not detect the disease in plants received months afterwards, and was driven to attribute their decay to weakness and soil.

20. With regard to the evidence of Mr. Munro, referred to in paragraphs 5, 6, and 7 of Dr. King's letter, I observe that it shows the plants it refers to were received from a third party; that they were not ordered by Mr. Munro, or for him; and he did not pay for them. This is the reason his name does not appear in my books.

21. With regard to the evidence of Mr. Munro before the Chinchona Commission, to which I took exception at the time, I wish to remark that, whether Mr. Munro refers in it to the first plants sent to Government or to the Darjeeling Chinchona Association, he was not qualified to give an opinion, as he was not in India when the plants were received. Mr. Munro, in paragraph 4 of his present letter, says: "Of the first consignment I know nothing." Dr. Simpson also states that the first instalment of plants was received long before the arrival of Mr. Munro. Notwithstanding this, Mr. Munro, in his evidence, said: "We received our first cuttings from the Nilgiris, and they were extensively affected with canker." The only plants upon the condition of which Mr. Munro was in a position to pronounce on their arrival on the Himalayas formed the *last batch*. With regard to these plants Mr. Munro is silent in his evidence.

22. In his present letter he speaks of the plants thus. He writes: "They showed symptoms of the disease we have since learned to call canker, as soon as it could be distinguished from injuries received during the journey." Mr. Munro does not state how long this interval was. The records would indicate it as an interval of many years after the arrival of the last instalment of plants in Sikkim.

23. Mr. Munro accuses me of inaccuracy with regard to some seeds I supplied the asso-

Date of Letters advising Despatch of Seeds.		Date of Application for, and Acknowledgment of Seeds sent.	
23 August 1866	{ C. Succirubra - 1 C. Officinalis - 1	{ W. Bourne, Esq. { Calcutta, 30 June 1866. Calcutta, 4 April 1867.	{
May 1867, Copy of Covering Letter mislaid -	(Estimated) - 2		
18 March 1868	{ C. Succirubra - 1 C. Officinalis - 0½ C. Micrantha - 1	{ Col. J. A. Angus { Darjeeling, 29 February 1868. 1 April 1868.	{
19 May 1868	{ C. Succirubra - 1 C. Officinalis - 2		
	Total - 9½	{ W. Lloyd, Esq. - 4 May 1868.	

ciation. He writes, in his present letter: "Mr. McIvor takes care not to mention the quantity of seeds sent. I will do so for him. It was of *C. Succirubra*, ¼ ounce." The letters noted in the margin, taken from my records, show that the quantity sent was 7½ ounces. I sent also about 2 ounces by pattern-post. My copy of the covering letter to this last consignment is mislaid, but no doubt the letter will be found on the records of the association.

24. Dr. King, at paragraph 9 of his communication, calls in question my statement that the "Sikkim stock of Pahudiana, raised solely from Java plants, has also been destroyed by canker." He further expresses his surprise that I should be ignorant that the Pahudiana produces no quinine, and was on that account abandoned. In reply, I observe that it was I who brought the fact of the unproductiveness of the species in question to notice in my letter to Government of August 1861. I was aware the cultivation of the species has been stopped by the Secretary of State. But all this has nothing to do with the fact to which I alluded, namely, that of the 5,092 Pahudiana plants put out at Sikkim in 1865, all were affected with canker, and many had died out at the date of my visit in 1871.

25. Dr. King

25. Dr. King states, in paragraph 10 of his letter: "A third mistake into which Mr. McIvor has fallen in this same paragraph 7 is that of saying that the Java variety of *C. Calisaya* (*C. Josephiana*) has been so affected by canker that only one plant existed on the Sikkim plantations at the date of my visit in February 1871, out of all the seeds and plants received of this variety; whereas Mr. Gammie, in the concluding paragraph of his memorandum, estimates the number at 8,000." It is Dr. King who has here fallen into error; he confounds *C. Calisaya* and *C. Josephiana Calisaya*. Mr. Gammie does not speak in the memorandum at all of *C. Josephiana*.

26. Mr. Gammie apparently implies, at paragraph 5 of his letter, that all the varieties of tree *Calisaya* on the Sikkim plantation were raised from Java seeds. This is erroneous: all the varieties but one were raised from Mr. Ledger's collection of seeds purchased and imported to India by Mr. Money. The Dutch obtained the varieties in question also from Mr. Ledger's collection, having previously had only one variety of tree *Calisaya*.

27. I have omitted to notice that, at paragraph 4 of his letter, Mr. Gammie states that I am mistaken in my impression that the cultivation of *C. Officinalis* was abandoned on account of canker; but adds: "*C. Officinalis* certainly died out, but from the roots, and not from what I understand to be canker, which affects the bark and not the root. On the 31st of March 1870 there were 930,704 plants of *C. Officinalis* in the Government plantations in British Sikkim, of which 406,899 were in permanent plantations. On the 5th July 1872 Mr. Gammie informs us that these plants had certainly died out. I should remark here that these plants were raised from stock received from Ceylon, and not from the Nilgiris, and that they were raised principally from seeds. Their disappearance is attributable to nothing but canker, which, as I have shown above, attacks roots as well as bark.

Report on the
Bengal Chinchona
Plantations, dated
Calcutta, 29 April
1870.

ORDER of the Madras Government thereon, 12th September 1873.

THE foregoing papers will be communicated to the Government of India, with reference to their Agricultural Secretary's letter, dated 1st October 1872, No. 418, and with the request that they may be published in the "Gazette of India" in continuation of previous correspondence.

2. It appears to the Governor in Council that Mr. McIvor has shown that it is extremely improbable that canker existed in the plants originally sent up from the Nilgiris as stock for the Sikkim plantations, though it is possible that the disease may have been generated on the journey.

Enclosure 3, in No. 32.

From the Acting Secretary to the Government of Madras, to the Secretary to the Government of India.

Sir,

Ootacamund, 2 October 1873.

YOUR letter, dated 1st October 1872, No. 418, gave cover to certain papers from the Government of Bengal, which, it was observed, left little doubt, in the opinion of the Government of India, of the correctness of the assertion as to the existence of canker in the chinchona plants originally sent up from the Nilgiris as stock for the Sikkim plantations.

2. I am now directed to forward the enclosed proceedings* of this Government, embodying letters from the Commissioner of the Nilgiris and from Mr. McIvor, containing remarks on the subject; and to request that these papers may be published in the "Gazette of India" in continuation of previous correspondence. * 12 September 1873, Nos. 90, 91.

3. It appears to this Government that Mr. McIvor has shown that it is extremely improbable that canker existed in the plants in question when originally sent up from the Nilgiris, though it is possible that the disease may have been generated on the journey to Sikkim.

-- No. 33. --

(No. 25—Revenue.)

From the Secretary of State for India to the Government of Madras.

My Lord, India Office, London, 16 December 1873.

* 11 July (No. 18) 1873.
 31 July (No. 21) "
 12 September (No. 24) 1873.
 26 September (No. 30) "
 10 October (No. 32) 1873.

Para. 1. I HAVE received and considered in Council your Excellency's Despatches noted in the margin,* on the subject of the cultivation of the Chinchona plants, and the analysis and sale of bark.

2. I observe with satisfaction that a statement of the out-turn as well as of the expenditure of the Chinchona plantations now appears in the tabular return, and that the figures have been rather under estimated. The receipts from the 25,000 lbs. of bark, the dispatch of which you announced in your letter of 12th September (No. 24) 1873, were estimated at 2,500 £. The sale took place on the 11th ultimo, and the sum realised was 3,490 £, the average price secured being 2s. 10d. per lb., while one parcel was sold at the very unusual price of 5s. 9d. per lb. Something like this average may be applied to the 33,000 lbs. of dry bark used by Mr. Broughton in the manufacture of amorphous quinine, which will place its value at not less than 3,300 £; and, judging from the same premises, the additional 50,000 lbs. of bark to be harvested this year will be worth 6,700 £. Thus, the total income from the plantations in 1873 will have been 13,490 £, which should increase in future years. I consider this to be a satisfactory interest on the whole outlay, and it entirely removes Chinchona cultivation from the category of experiments.

3. The question between the coppicing and mossing systems of taking the crops of bark is deservedly receiving very careful attention. It would appear that, under scientific and skilled management, the trees which are treated with the mossing process can be made to yield three times as much bark in the same time as the same number when coppiced. This, at least, is the deduction of Mr. Cockerell, the Commissioner. It must however be borne in mind that the mossing process is not likely to be successful unless skilled scientific management is available, and that, under other circumstances, an ordinary cultivator must resort to coppicing. It is therefore desirable that both systems should continue to receive attention on the Government plantations.

4. The means of supplying the Chinchona febrifuge to the people of India in a cheap form, and in sufficient quantity, is a question which must always be considered as paramount in the conduct of the plantations. The object is to be attained in two ways, which must supplement each other; first, the manufacture from bark on the spot; and, second, for some years to come at least, the purchase of the febrifuge in the cheapest available form in Europe.

5. As regards the first way, I observe that the quinologist was supplied with 33,000 lbs. of dry bark during the current year, for the manufacture of so-called "amorphous quinine." I shall be glad to receive information respecting the quantity of this form of the febrifuge that is annually issued, the quantity that has been used in the Medical Departments, and the quantity that has been sold to the public, with the price, and the judgment that has been formed with respect to its efficacy. It would also be useful if some details could be furnished to me with reference to the cost of the manufacture, the prospect of reducing it if the demand increases, and the probable extent of such increase.

6. I perceive, from a return that has been prepared in the Store Department of this office, that latterly the indents for quinine and other Chinchona alkaloids from your Presidency have been very considerably smaller than those from Bombay. From 1869 to 1873 the indents for quinine from Bombay amounted to 3,382 lbs., while during the same period those for quinine and all other Chinchona alkaloids from Madras only amounted to 2,275 lbs. It will be interesting

interesting to ascertain whether this smaller demand from a larger Presidency is due to Mr. Broughton's local manufacture, and to what extent.

7. With reference to the second means of supplying the people of India with the febrifuge, namely, the purchase of the cheaper though equally efficacious alkaloids in this country, I am surprised to find that the valuable reports of the Chinchona Commission appointed by your Government five years ago should have borne so little fruit. It was the unanimous opinion of the medical men, who investigated the question with praiseworthy care and diligence, that the three other chinchona alkaloids that were supplied to them were almost, some thought quite, as efficacious as quinine. Yet chinchonine, chinchonidine, or quinidine have only been indented for in very small quantities by your Government since the date of the Report of the Commission.

8. Mr. Howard, the eminent quinine manufacturer, has been consulted on the subject, and I herewith transmit 20 copies of his letter.* You will see that he particularly points out the value of chinchonidine as likely, from its efficacy and cheapness, to supply the means of enabling us to bring the chinchona febrifuge within the reach of the mass of the people. Another very important advantage that will be derived from the extensive use of the febrifuge in the form of chinchonidine is that it will extend the cultivation and increase the value of *C. Succirubra*, the species which, while producing that particular alkaloid in very considerable quantities, also grows more readily and over a wider range than any other in the hill districts of your Presidency.

* Dated 21st Oct. 1873.—See Part I., page 139.

9. I request that the suggestions contained in Mr. Howard's letter may receive the careful consideration of your Excellency's Government, and that you will furnish me with your matured views on the subject.

10. The specimens in triplicate of the flowering and fruit-bearing branches and the barks of the species of chinchona grown on the Nilgiri Hills, referred to in your Despatch, dated 11th July (No. 18) 1873, have been duly received. One set has been presented to the Herbarium at Kew, another to the British Museum, and the third will be preserved in this office.

I have, &c.
(signed) Argyll.

— No. 34. —

(No. 40—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Duke, Fort St. George, 16 December 1873.

WITH reference to the Despatch marginally noted,* we have the honour to forward, for your Grace's information, our proceedings† of 2nd instant, No. 1,334, embodying a report from the Officiating Surgeon General, Indian Medical Department, on the therapeutic action of the Calcic Quinovinate manufactured by the Government Quinologist in the treatment of fevers, dysentery, and diarrhoea. The previous correspondence on the subject is also enclosed.

* From Secretary of State, 27 April 1871.

No. 11, Public. See page 27.

† Proceedings of Govt., 5 June 1871.

" " 19 "

" " 12 July "

" " 2 Dec. 1873.

2. Your Grace will perceive from our proceedings of 2nd instant that further experiments with the drug are not considered necessary.

We have, &c.
(signed) Hobart, &c.

Enclosure 1, in No. 34.

From the Government Quinologist to the Acting Secretary to Government, Revenue Department, Fort St. George; dated Ootacamund, 9th June 1871.

WITH reference to G. O., Revenue Department, No. 990, of 5th June 1871, I have the honour to state that in 1869 I addressed the Medical Inspector General on the subject of Quinovin, and gave a translation of parts of an article by Dr. Kermer, which had appeared in the *Vierteljahresschrift für practische pharmacie* (Vol. xvii., s. 335). I also forwarded a sample of calcic quinovinate, and requested that it might be experimented upon therapeutically. The letter and extract were published, I found, in the "Madras Monthly Journal of Medical Science" for January 1870, where, in a footnote, the quinovinate was stated to be under trial.

2. About a year since I was applied to for a further quantity, which I furnished; but I have as yet received no report as to the results. I am greatly desirous of hearing the conclusions to which the Medical Department have arrived on the subject, and trust soon to receive the report. Further supplies of calcic quinovinate will be supplied if required.

Enclosure 2, in No. 34.

From the Acting Inspector General, Indian Medical Department, to the Secretary to Government, Revenue Department; dated Fort St. George, 1st July 1871.

G. O., Revenue Department, No. 990, of 5th June 1871; and G. O., No. 1085, of 19th June 1871.

I HAVE the honour, with reference to the proceedings of Government marginally noted, to submit a report on the medical value of the calcic quinovinate, a small supply of which was prepared and furnished by Mr. Broughton.

2. The cases in which it has been used are altogether insufficient in number to admit of any conclusions being arrived at as to its therapeutical virtues. But, so far as will be seen from the annexed tabular statement, the results have been unsatisfactory.

3. Five cases of malarious fever were treated with the drug, and of these three recovered, one was not relieved, and in the fifth there was a doubt as to whether the case had ever been one of fever. A further experience, therefore, will be needed before an opinion can be formed as to its antiperiodic powers.

4. In 10 cases of diarrhœa the effects were even less satisfactory, but in some of the cases the remedy had not a fair trial, as the patients were old and debilitated, and the disease had been of long standing.

5. Only one case of dysentery was subjected to the action of the drug, and the patient recovered, but no deduction can be drawn from the result of a single case.

6. It is, however, extremely desirable that a remedy so highly spoken of should be subjected to more extensive trials in the manner proposed by the Right Honourable the Secretary of State for India; and to permit of this being done, I have the honour to recommend that Mr. Broughton may be requested to furnish me with at least five pounds of the calcic quinovinate.

TABULAR STATEMENT of the Results of Trials of the Therapeutical Effects of the Calcic Quinovinate manufactured by J. Broughton, Esq.

DISEASES.	Number of Cases.	Average Quantity of the Drug administered in each Case.	RESULTS.		
			Successful.	Un-successful.	Doubtful.
Febris, intermittens - - - - -	4	111	2	1	1
„ remittens - - - - -	1	80	1	—	—
„ typhodes - - - - -	1	72	- -	1	—
Diarrhœa - - - - -	10	156½	2	4	4
Dysentœa chronica - - - - -	1	120	1	—	—

ORDER of the Madras Government thereon, 12th July 1871.

COMMUNICATED to the Government Quinologist, who will furnish the Inspector-General, Indian Medical Department, with five pounds of the calcic quinovalate, as requested by him in paragraph 6; and the Inspector General will in due course report the results of the trials with this further supply.

Enclosure 3, in No. 34.

From the Officiating Surgeon General, Indian Medical Department, to the Secretary to Government, Revenue Department, Fort St. George; dated 16th September 1873.

IN submitting this report on the therapeutic action of calcic quinovalate in the treatment of fevers, dysentery, and diarrhoea, I have the honour to express regret at the delay in its transmission.

Proceedings of Government, Revenue Department, No. 1202, of 12th July 1871.

2. The subjoined tabular statement shows that the drug was used in 144 cases; its exhibition was successful in 70, doubtful in 7, and unsuccessful in 67.

TABULAR STATEMENT of the Results of Trials of the Therapeutic Action of the Calcic Quinovalate, manufactured by *J. Broughton, Esq.* (from 31st January 1870 to 10th February 1873).

DISEASES.	Number of Cases.	Average Quantity of the Drug administered in each Case.	RESULTS.		
			Successful.	Unsuccessful.	Doubtful.
		Oz. Grains.			
Intermittent fever - - - - -	79	0 124 ²³ / ₁₀	44	34	1
Simple continued fever - - - - -	1	0 48	-	-	1
Febricula - - - - -	8	0 98	5	3	—
Dysentery - - - - -	35	0 69 ²³ / ₃₅	12	22	1
„ chronic - - - - -	2	3 91 ¹ / ₂	2	—	—
Diarrhoea - - - - -	19	0 49 ³ / ₁₉	7	8	4

3. In less than half of the cases, therefore, can the calcic quinovalate be credited with any remedial power, while in almost the same number it failed to bring about recovery.

4. Quinine, as a febrifuge and antiperiodic in intermittent and remittent fevers, and ipecacuanha in dysentery, have been by long experience proved to be medicines of much greater potency. The success of the calcic quinovalate cannot compare with that of their administration in the diseases in question.

5. As it is clearly a physician's duty to restore his patient to health as speedily as possible, he is bound to use those means that are best calculated to bring about this result. Acting on this principle, he must prefer resorting in the first instance to the employment of medicaments of proved efficacy, like quinine and ipecacuanha, to using one, like calcic quinovalate, which is as likely to fail as to succeed.

6. Still, the experiments which have been made show the drug in question to have some therapeutic action in those diseases for the treatment of which it has been recommended; and it is quite possible that calcic quinovalate may, in certain cases, prove a successful remedy, when quinine in fevers and ipecacuanha in dysentery may have failed. As a second resort it may be beneficial; as a first resort it is not justifiable.

7. In conclusion, I beg to forward, as an Appendix, extracts from the reports of the several medical officers who were called upon to try the calcic quinovalate.

APPENDIX.

EXTRACT from the Report of Surgeon Major *C. J. Rogers*.

Native Infirmary, Madras.—"In the six cases of diarrhœa and dysentery treated, only two recovered.

"In fever the treatment appeared more successful; two recovered out of three treated."

EXTRACT from the Report of Surgeon *W. N. Chipperfield*.

General Hospital, Madras.—"The results at which I have arrived are that the remedy may be found useful in cases of very chronic dysentery; that it is a slowly-acting remedy, and requires to be long continued before its efforts become manifested; that in the two instances in which I have found it beneficial, I had to combine opium with it; that as an astringent for ordinary diarrhœa it is useless; that I have not observed any febrifuge properties in the preparation; and that one great objection to its use is its being required to be given so frequently as every hour or two, and both day and night."

EXTRACT from the Report of Surgeon Major *L. W. Stewart*.

Secunderabad.—"To summarise and draw conclusions from these cases, I am of opinion that the calcic quinovalinate is not at all equal as an antiperiodic to quinine, but it would appear to possess only tonic properties, similar to most other vegetable bitters, *e.g.*, chiretta, calumba, &c.

"In cases of febricula, I consider the medicine might be employed with advantage, but not as an antiperiodic in the intermittent type of fever, or in acute dysentery. As far as my time has admitted, after a careful consideration in the treatment of these and former cases of both ague and dysentery with this medicine, I beg now respectfully to record the above as my opinion on the virtues of the calcic quinovalinate."

EXTRACT from Report of Surgeon *L. C. Nanney*.

Secunderabad.—"The result of my experiments was not sufficiently encouraging to induce me to risk the employment of it in a severe case, nor could I conscientiously attempt its use in dysentery, or peril life by the use of a drug which so insufficiently fulfilled the claims that had been advanced for it, when I had reliable remedies at hand.

"From my brief experience of the calcic quinovalinate, I doubt the possibility of its substitution for ipecacuanha. With regard to its use as a substitute for quinine, I do not think more efficacy can be claimed for it than that of a tonic of the mildest description, in which form the tediousness of its preparation would preclude its being largely employed.

"In three cases out of six now recorded the fever was checked by the treatment adopted; these were of so mild a type that probably rest with a simple aperient might have proved sufficient to produce the same effect.

"In the second case, the fever appeared to be merely temporary, as the fever returned after an interval of four days, when I thought it inexpedient to persevere with the experiment.

"In the three remaining cases, it appeared to exert no effect, and, after continuing its use for seven days without any favourable result, other treatment had to be adopted, to which the fever yielded in a single day in each case.

"From these remarks, it will be seen that my experience of the calcic quinovalinate in the mild cases, on which I thought it prudent first to ascertain its qualities, was not such as to warrant my employing it in any severe cases, especially in dysentery, in which the experiment might prove to be at the expense of life to the sufferer."

EXTRACT from Report from Surgeon *C. A. Andrews*.

Mercara.—"The conclusion at which I have arrived is that the drug has some curative power in certain cases of dysentery, but it is far less certain in its action than ipecacuanha; it is, however, free from the nauseous properties of the latter drug, and in some cases even will effect a cure when the latter fails.

"I have had so few opportunities of experimenting with the drug in genuine, uncomplicated cases of dysentery, that I hesitate to give a more decided opinion about its action; but, although it is not likely to supersede ipecacuanha, it will, I think, become a valuable aid in the treatment of this disease."

EXTRACT from Report of Surgeon *J. Houston*, M.D.

Mysore.—"The medicine, in the form of solution, has been exhibited to 17 patients, suffering from dysentery or diarrhoea; of these 10 were treated at the civil hospital and seven in the Mysore Jail. It has not proved successful in my hands, except in one instance, when it was administered to a prisoner for seven days. Patients suffering from dysentery and diarrhoea at the civil hospital are often on admission in a very reduced state, and if the treatment adopted is not quickly effective, it cannot be persevered with, but must give way to such other measures as the nature of the case may seem to demand. I therefore usually did not consider it advisable to continue the use of the Quinovinate beyond a day or two, and at the jail, where the cases of dysentery were second or third attacks, I thought it safest to have recourse at once to more established remedies.

"Though my experience of the Quinovinate has hitherto been discouraging, it appears to me probable that it may prove serviceable in bowel complaints, when complicated with splenic enlargement."

EXTRACT from Report of Surgeon *D. W. Trimmell*.

Raipur.—"The number of days each case was under treatment was five and half days; in 21 cases no result was obtained, and the medicine had to be discontinued; each case under treatment was five and half days.

"In seven cases, irritation of the stomach and bowels occurred. The quantity taken by each case cured was $97\frac{1}{2}$ grains; of those not cured 102 grains.

"In one case a protracted trial of 18 days was made, but without results.

"I am of opinion that the drug is less efficacious than Quinine."

— No. 35. —

(No. 1—Revenue.)

From the Government of Madras to the Secretary of State for India.

Fort St. George, 13 January 1874.

My Lord Duke,

WE have the honour to forward, for your Grace's information, our proceedings marginally noted, embodying a report from the Government Quinologist of the results of his investigation of the tubers of *Aconitum heterophyllum*, or the native febrifuge, "Atis."

8th December 1873.

We have, &c.
(signed) *Hobart*, &c.

Enclosure in No. 35.

From the Government Quinologist to the Acting Secretary to Government, Revenue Department; dated Ootacamund, 25th October 1873:—

IN accordance with G. O. No. 714, dated 9th July 1873, Revenue Department, I have the honour to communicate the results of my investigation of the tubers of *Aconitum heterophyllum*, of which the Hindustani name is "Atis."

2. The examination of this native medicine was undertaken by the advice of a Bengal medical officer, who informed me that of all the febrifuge medicines employed in India, except

except chinchona, this was the most effective. It has a place in the Indian Pharmacopœia, and at page 434 of that work high therapeutic value is given to it; the names of Drs. Heming, Balfour, Dymock, Moore, Forbes Watson, and others being cited. Though the plant grows on the western Himalaya it can be purchased in nearly all the bazaars of South India, though its use is, of course, more general in the northern Presidences.*

3. The appearance of the tubers is described at page 4 of the Indian Pharmacopœia. They are farinaceous, have an intensely bitter taste, and are not poisonous, being, as therein stated, free from the poisonous alkaloid aconitine.

4. After much labour I succeeded in isolating the bitter febrifuge alkaloid, which, from its composition and properties, I find to be a new substance to which I propose to give the name "Atisine."

5. The method which I have found the most convenient for obtaining this alkaloid is as follows:—

6. The roughly powdered tubers are submitted to two exhaustions with boiling alcohol, and the resulting tincture is separated by filtration through cloth. The whole of the alcohol is then separated by distillation, and the thick extract is mixed with an equal bulk of cold water, made alkaline with caustic soda, agitated with chloroform and allowed to settle. The whole of the atisine is then in solution in the chloroform, which is separated, the chloroform distilled off, and the atisine dissolved in dilute sulphuric acid, and decolourized by animal charcoal. From this solution atisine nearly pure is precipitated as an extremely bulky white hydrate on the addition of caustic potash. In order to obtain it pure, it has to be re-dissolved in ether, again re-distilled and again dissolved in dilute hydrochloric acid precipitated by dilute ammonia and dried. The separation of atisine is neither difficult nor laborious.

7. Atisine is soluble to a considerable extent in water, to which it imparts a most intensely bitter taste. It forms a very bulky hydrate from which the water separates at a steam heat. It becomes anhydrous at 100° C. It commences to agglutinate at 76° C, and is perfectly fused at 85°. After fusion, it exactly resembles quinine in a similar state. Its alkaline properties are well marked, as it reddens moistened turmeric paper, and completely neutralizes all acids. It is soluble in carbonic disulphide and benzol. I have not succeeded in obtaining the free alkaloid in a crystalline form.

8. Its composition was determined by an analysis of its platinum double salt, which is readily precipitated from the hydrochloric acid solution of the alkaloid by the addition of platinum tetrachloride. Without entering into details, I find the formula of atisine is $C_{46} H_{74} N_2 O_5$, the truth of which I was able to corroborate by a carefully conducted volumetric determination of the amount of hydrochloric acid required for neutralization. Atisine appears to have no rotatory effect on a beam of plane polarized light. Like quinine, atisine is diacid. Solution of its salts with oxygen acids are fluorescent.

9. I have obtained a crystalline sulphate of atisine, but with much difficulty in presmatic needles. The hydrochlorate is readily obtained by pouring dilute acid over a mass of the free base in the cold; crystalline crusts readily forming, which resemble quinidine hydrochlorate on examination. I have failed to obtain any other crystalline salts, though I have prepared the acetate, nitrate, and oxalate as amorphous masses.

10. A solution of an atisine salt is precipitated by tannin, mercuric chloride, potassic chromate, and ferrocyanide; also by phospho-molybdic acid and biniodide. Atisine quietly dissolves in strong sulphuric and nitric acids without any decomposition. It is a well and clearly defined alkaloid, quite new to chemists, and will very probably be of future use in medicine.

11. A further description of the chemical properties of atisine would be out of place in the present communication. I propose communicating a fuller description to the Chemical Society.

12. As the amount of atisine actually present in the tubers is but small, it would appear that this alkaloid would require to be medicinally used in very small doses. I have the honour to forward a specimen of "Atis," and one of Atisine hydrochlorate, the salt of the base most fit for therapeutical use. I would suggest that these specimens, if not otherwise required, should be presented to the Central Museum at Madras.

* In a white febrifuge medicine employed by the Karens in British Burmah, I have detected "Atisine," therefore, atis is a component of the drug.

ORDER of the Madras Government thereon, 8th December 1873.

COMMUNICATED to the Surgeons-General, British and Indian Medical Departments, to whom a specimen of Atisine hydrochlorate should also be sent by the Government Quinologist.

2. The specimen forwarded will be sent to the Museum as suggested.

3. Mr. Broughton is thanked for his report, copy of which will be forwarded to the Secretary of State and Government of India.

— No. 36. —

(No. 2—Revenue.)

From the Secretary of State for India to the Government of Madras.

My Lord,

India Office, London, 19 March 1874.

1. I HAVE received and considered in Council your Excellency's Despatches, dated 16th December (No. 40), 1873, and 13th January (No. 1), 1874, the former reporting the result of experiments on the therapeutic action of calcic quinovate in the treatment of fever and dysentery, and the latter forwarding Mr. Broughton's account of the results of his investigations of the tubers of *Aconitum heterophyllum*.

2. The use of quinovate was recommended on account of its cheapness and the facility with which abundant supplies can be procured. Its inferiority to quinine in cases of fever, and to ipecacuanha in dysentery was understood, but it was believed, with reference to the greater cost of the more potent medicines, that quinovate might prove a valuable auxiliary in the treatment of diseases which annually commit such ravages in British India. I observe that Dr. Andrews, of Mercara, is of opinion that quinovate will become a valuable aid in the treatment of dysentery; and Dr. Houston, of Mysore, also thinks that it would prove serviceable.

3. I am certainly of opinion, looking to the high price of the more potent remedies, that the importance of making the natives of India acquainted with a more economical though less efficacious remedy ought not to be lost sight of. At a time when epidemics are ravaging a district the sufferers are occasionally so numerous that the more expensive medicines can only be administered to a small portion of them. In April 1871, for instance, 114,012 persons sought relief at the dispensaries in the Burdwar district, and many undoubtedly succumbed owing to the impossibility of supplying them with expensive remedies.

4. On these grounds I have to request that you will cause further and careful experiments to be instituted as to the value of the drug in the treatment of dysentery.

5. I have perused Mr. Broughton's report on the results of his investigation of the tubers of *Aconitum heterophyllum*, the Hindustani *Atis*, and perceive that he has succeeded in extracting a new alkaloid previously unknown, to which he has given the name of *Atisine*, the separation of which is neither difficult nor laborious. This substance may prove of future use in medicine, and, as it is quite new to chemists, I desire that specimens of the drug, as sold in the bazaars, and of the *Atisine hydrochlorate*, may be forwarded to this office.

I have, &c.
(signed) Salisbury.

— No. 37. —

(No. 25—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Marquis,

Ootacamund, 30 October 1874.

Proceedings of
Government, 2nd
September 1874.

WE have the honour to forward, for your Lordship's information, the Report on the Government Chinchona Plantations on the Nilgiri Hills, for the official year 1873-74, together with our Proceedings, dated 2nd September 1874, embodying the observations and orders recorded by us on a review of that Paper.

We have, &c.
(signed) Hobart, &c.

Enclosure 1, in No. 37.

From the Commissioner of the Nilgiris to the Acting Secretary to Government, Revenue Department; dated Ootacamund, 30th June 1874.

I HAVE the honour to submit the report on the Government Chinchona Plantations on the Nilgiri Hills, for the official year 1873-74.

2. The season was a severe one, and the plantations suffered from frost. Seven acres of chinchona in one plot were destroyed by frost at Ossington, adjoining the Government plantation at Neddivuttum.

3. Propagation has this year been confined to the new species and varieties. Mr. McIvor has issued to the public 83½ oz. of chinchona seeds. Mr. Broughton has received 91,773 lbs. of green bark during the year. Half of it was branch bark of high quality. Inferior branch bark from the Government plantations fetched from 2 s. 4 d. to 3 s. 6 d. per lb. in the London market.

4. In May 58 *succirubra* of 12 years old were, under the direction of Mr. Broughton, coppiced a foot from the ground, leaving the shoots on the stools standing; and in June 53 crown barks were similarly coppiced. In October 57 *succirubra* were coppiced close to the ground at the request of Mr. Broughton. Twenty-one of these plants have died.

5. The season has been very dry for barking, and not so much bark has been, therefore, taken as was anticipated. Referring to a plot of 1,000 *succirubra*, Mr. McIvor reports they have been barked during the year, and have yielded in all 9 lbs. of dry bark each in three years' harvesting.

6. Mr. McIvor proceeds to touch upon the cost of mossing and peeling bark, and reports it as 1-5 per lb. of dry bark in the above 1,000 trees. He states, however, that the larger the tree the greater the cost, owing to ladders being used which take time and labour to move about. Mr. McIvor hopes to reduce the cost of mossing and barking large trees by employing suitable scaffolding instead of ladders.

7. Referring to the prices obtained for the consignments of bark sent to England during the year under report, Mr. McIvor reports that mossed bark has continued to sell at higher rates than natural bark.

8. Mr. McIvor draws attention to the circumstance that the high prices ruling for bark in the past season have attracted double the usual quantity of bark from South America. He points out that this increased supply was quite opposed to anticipation, and dwells upon it as an incident of exceeding interest in relation to the prosperity of Chinchona cultivation. It is obvious that, if enhanced prices bring forward enhanced supplies from natural forests, the success of the Nilgiri plantations, in a commercial point of view, will be seriously jeopardised.

9. Mr. McIvor reports the discovery of a new hybrid which has been called *C. Pubescens*. It appears that it is very hardy and extraordinarily rich in alkaloids. Mr. McIvor proposes to propagate this hybrid.

10. The

10. The application of manure to plots on the Government plantations has not shown any certain results.

11. Mr. McIvor commends the officers in his establishment, and thanks Dr. DeVry and Mr. Howard for their kindness during the year under report in making analysis of Government bark.

Enclosure 2, in No. 37.

Report on the Government Chinchona Plantations on the Nilgiris for the Official Year 1873-74.

THE past season has been an exceptional one with severe and long-continued drought. The heaviest frost observed during the last 25 years occurred on the night of the 13th January. This frost did great damage to private Chinchona plantations; fortunately, however, the Government plantations have escaped with comparative immunity. On the Dodabetta Plantation about 175 trees were killed down to the ground. Our extensive plantations at Neddivuttum escaped without any plants being destroyed. Here, however, the effects of the cold caused the leaves to fall off from such trees as were planted in low or land-locked situations, as these situations retain the cold air as it settles down from the neighbouring hills. In such places the growth of the plants was retarded for the time, but they have now quite recovered from the effects of the cold. On a private estate, immediately adjoining Neddivuttum, the frost on the night in question killed about 7,000 large trees of seven years' growth, and destroyed 23,000 younger plants, or in all about 30,000. Some of the private chinchona plantations on the east side of the hills also sustained damage from this frost. The long dry weather which succeeded this severe cold has also been very trying, especially to young plants. The season has, therefore, been altogether an unfavourable one.

2. As mentioned in last report our propagation is now confined to the new species and varieties of Pitayo bark and *C. Angustifolia*. The average monthly increase of these varieties has been 578. The total number of plants of *C. Pitayensis* propagated during the year is 2,293 and of *C. Officinalis* var. *angustifolia* 4,639, making a total of 6,932.

3. The extension of our permanent plantations during the last year has been confined to *C. Pitayensis* and *C. Angustifolia*. Of the former 4,686 plants, and of the latter 15,743 plants were permanently planted out on the Hooker estate at Pykarra.

4. The total number of plants planted out in permanent plantations up to 31st March last was as follows:—

C. Officinalis or crown barks - - - - -	508,878
Do. var. Angustifolia - - - - -	22,404
C. Succirubra or red barks - - - - -	579,938
C. Calisaya or yellow barks - - - - -	34,250
C. Micrantha or Peruvian or grey barks - - - - -	28,759
C. Pitayensis (Pitayo bark) - - - - -	13,380
Other species - - - - -	2,849
Total - - - - -	1,190,458

5. The average height of our oldest and finest plants of *C. Succirubra* is 32 feet, with a circumference of stem of 28 inches; the average height of our finest plants of *C. Officinalis* being 25 feet, with a circumference of 18 inches. The number of plants issued to the public during the year is 964, and 83½ oz. seeds or seeds sufficient to raise 2,087,250 seedlings. Of tea plants 2,030 and of green tea leaf 1,017½ lbs. have been supplied to Major Jennings. The quantity of green bark supplied to the Government quinologist is 91,773 lbs., viz., 45,206 lbs. of stem and 46,567 lbs. of branch bark. The whole of this branch bark was of high quality, and of the remainder, much of which was rejected as not being "worth the cost of working," sold in the London market at from 2 s. 4 d. to 3 s. 6 d. per lb.

6. With the exception of 1,748 lbs. of trunk and 464 lbs. of branch bark obtained by coppicing, the bark harvested this season has been taken by the mossing process only.

7. The principal work performed has been the general conservancy of the estates, collection of bark, clearing, weeding, maintaining drains and fences, felling, pitting, and bringing into cultivation 25 acres of land on the Hooker estate at Pykarra for the reception of our new varieties of *C. Pubescens*, *C. Pitayensis*, and *C. Angustifolia*.

8. During the two previous years no coppicing has been done, in consequence of representations made by Mr. Broughton in paragraph 3 of his letter of the 7th June 1871 (recorded in G. O., 13th July 1871), where that gentleman states, "At least two more years should elapse before coppicing can be profitably conducted." Accordingly last

spring our coppicing experiments were resumed. On the 30th of May 1873 Mr. Broughton selected a plot of 58 plants of the finest *red bark* trees of the planting of August and September 1862. These trees were coppiced at or within a foot from the ground, the shoots springing from the stools being left. These shoots varied from 2½ to 14 feet in height at the date of coppicing. They were again measured on 30th May 1874, and the average growth in one year was found to be 1 foot 11½ inches; the maximum growth 4 feet, the minimum growth 3 inches. One plant only had died. The largest tree at the date of coppicing was 36 feet in height. These 58 plants gave 286½ lbs. of dry trunk bark, equal to 4.93 lbs. per tree. The cost of cutting down and barking the trees was rs. 7., or as. 1. 11. per tree, and about 5 pies per lb. of dry bark.

9. On the 2nd June 1873, a similar plot of 53 *crown bark* trees of the planting of 1863 was selected by Mr. Broughton, and coppiced in the same manner as the trees of *C. Succirubra* described above. These 53 trees yielded 193 lbs. of green stem bark and 9 lbs. of branch bark; in all, 202 lbs., equal to 85½ lbs. of dry bark, or 1.61 lbs. per tree. The cost of felling the trees and barking was rs. 4. 15. 6., or as. 1½. per tree, and about 11 pies per lb. of dry bark. The shoots of these trees were left on the stools. They were measured on the 2nd June 1874. The average growth was found to be 1 foot 7½ inches; the maximum growth 2½ feet, the minimum 5 inches. Nine plants had not sprouted, and one had died.

10. Another plot of 57 *C. Succirubra* or *red bark* trees of the planting of August and September 1862, was selected by Mr. Broughton, at Neddivuttum, on the 14th October 1873, and, at that gentleman's request, coppiced close to the ground (*i. e.*, within 6 inches), and all the shoots removed. The bark obtained from these trees was 746 lbs. of green trunk bark, equal to 264 lbs. of dry bark, or 4.64 lbs. per tree. The cost of coppicing and taking the bark was rs. 6., or as. 1. 8. per tree, or about 4½ pies per lb. of dry stem bark. These trees were examined on the 5th June 1874. The average growth of the shoots was 1 foot in 7½ months, the maximum growth 1½ feet, the minimum ½ foot. One plant had not sprouted, and *twenty-one had died*. This forms the fifth coppicing experiment carried out in the Government plantations, and the results obtained show the collection of bark by coppicing to cost 8 pies per lb. of dry bark from 8 year old trees, and 4½ pies per lb. from 11 year old trees. Our experience up to the present date show the collection of bark by mossing from 8 and 9 year old trees to be as. 1. 2. per lb. of dry bark, and as. 1. 7. per lb. when collected from 10 and 11 year old trees. The cost of collection of bark, therefore, by the mossing process is nearly twice as expensive when taken from young trees which can be reached from the ground, and when taken from trees where ladders have to be used is more than four times as expensive as the collection of bark by coppicing.

	Lbs.	
In 1871-72	- 2,988	mossed, original.
In 1872-73	- 764	renewed.
In 1873-74	- 1,546	ditto.
In 1873-74	- 770	upper strips.
	<hr/> 6,068	

11. In consequence of the long-continued drought, it has been found impossible to collect the usual quantity of bark this spring, as the sap had not risen in the plants at the time of our spring barkings. From the 1,000 experimental mossed trees we collected during the year 1,546 lbs. of renewed bark, and 770 lbs. of natural bark from the upper strips of the trees. This gives the total yield of these 1,000 trees 6,068 lbs. of dry trunk bark. In addition to this trunk or stem bark, over 10,000 lbs. of green *branch bark*, equal to 3,000 lbs. dry bark, has also been collected from the 1,000 11 year old mossed trees, making the total yield of dry bark upwards of 9 lbs. per tree in three years.

12. At paragraph 14 of my Annual Report for 1871-72, recorded in Proceedings of Government of 20th August 1872, I gave the cost of mossing and collecting 2,988 lbs. of dry bark from these 1,000 experimental trees at rs. 221. 13. 4., or as. 1. 2. per lb. Since that date we have collected 3,080 lbs. at rs. 312. 8. 0.; or as. 1. 7. per lb. of dry trunk bark. This includes all cost for labour, moss, mossing, repairs, etc., but not the cost for superintendence. We then find that the cost of removing the 6,068 lbs. of dry trunk bark during the three years from the 1,000 trees experimented on as being as. 1. 5. per lb. of dry bark. The bark within 6 feet from the ground is removed at a trifling cost, not exceeding as. 2. 2. per tree, including all charges; but the removal of the upper strips of bark is expensive, the cost being, when the men have to use ladders and new moss, on an average as. 3. 3. per tree. This arises from the loss of time in moving the ladders from tree to tree. In future, no doubt this cost will be decreased when properly constructed planks and trestles are applied instead of the ladders now in use. The bark has been removed from these 1,000 trees to a height of between 17 and 20 feet from the ground.

	Lbs.	
In 1871-72	- 1,174	
In 1872-73	- 2,365	
In 1873-74	- 2,227	
Upper strips -	626	
	<hr/> 6,392	

13. From the 3,000 experimental trees, which were barked at six years old and now in their ninth year of growth, we have collected 6,392 lbs. of dry stem bark, or 2.13 lbs. per tree. The branch bark from these trees has been supplied to Mr. Broughton for manufacture on the spot, and the stem bark sold in the London market.

14. By paragraph 2 of the Despatch of the Secretary of State of 16th December 1873, recorded in G. O., 2nd March 1874, it appears that the 23,646 lbs. of chinchona bark, forwarded from these plantations in July last, realised in the London market 3,490 l. In these sales the mossed crown bark from Dodabetta realised 2 s. 2 d. per lb. more than the unmossed bark from that plantation, and the mossed bark from Neddivuttum 10 d. per lb. more than the unmossed bark. This bark arrived in the London market when the prices were

were at the highest point touched since 1853. Now the price of bark and quinine is slowly but steadily decreasing. This arises from the fact that the extreme rates realised for bark during 1873 so stimulated the import from South America that it rose to upwards of 5,000,000 lbs., or more than double the quantity ever imported in any one year; the average imports for the last 30 years being one and a quarter million annually. The largest quantity imported in one year previous to 1873 was a little more than two and a half million pounds. These facts appear to indicate (contrary to general received opinions) that the bark supply of South America has not in any way become exhausted, but, on the contrary, is capable of being extended to an unlimited degree when the prices are sufficient to incite the cascarilleros to indent extensively on what appears to be an unlimited supply of bark in the natural Peruvian forests.

15. A very important variety of chinchona (*C. Pubescens*, Howard) has been discovered among the various varieties which we have hitherto termed hybrids. In 1871 I directed the attention of the Government quinologist to this hairy-leaved variety, and to another of the same habit and nearly allied, but with smooth leaves, both being remarkable for their rapid growth and hardy constitution. They stand wind well, which is of great advantage, as wind is very injurious to chinchona cultivation on the Nilgiris. They also yield a thick bark, and are altogether most promising varieties. Mr. Broughton informed me that the yield of quinine in this bark was unsatisfactory, and at paragraph 12 of that gentleman's report, recorded in G. O. of the 26th September 1871, remarks: "Since that time I have made numerous analyses of the bark of various hybrids that I have observed, but in no instance have I found any of special excellence. In fact, it appears to me that these hybrids combine the bad qualities of both their parents." These results caused me for a time to suspend further inquiry into the value of these barks. In December 1872, together with a number of other kinds of bark, I forwarded to Dr. De Vrij a sample of the barks in question, and that gentleman obtained from the hairy-leaved variety the enormous quantity of 10.67 per cent. of total alkaloids, of which 4.72 per cent. was crystallised sulphate of quinine. In order further to test the value of this variety, I sent to Mr. Howard a sample grown on a different soil and exposure for commercial analysis, which that gentleman very kindly undertook. The results obtained by Mr. Howard were still more favourable, and I quote at foot,* from his letter of 20th February 1874, the opinion of this eminent quinologist with reference to this species which he has named "pubescens." It is also worthy of notice that Dr. De Vrij found the smooth-leaved hybrid above referred to, to give 6.05 per cent. of total alkaloids, of which 2.97 per cent. was crystallised sulphate of quinine; therefore, this variety is also of great value for its quinine-producing qualities, although much inferior to *C. Pubescens*, while in vigour of growth and hardy constitution it is simply its equal. A piece of land is now being prepared to form a small plantation of *C. Pubescens*.

16. A quantity of farmyard manure has been collected for application to the trees of *C. Officinalis* on the Dodabetta and Neddivuttum plantations. The manure supplied by Messrs. McMeikan & Co., of Melbourne, was applied last year to 355 plants of *C. Officinalis* on the Dodabetta plantation, each alternate row being manured with farmyard manure, in order that the difference may be recorded. As yet there is no indication of any difference in the condition of the plants, and it is probably too early to expect any; a detailed account of the action of different manures will, therefore, be forwarded hereafter.

17. Appended is a table giving the results of the expenditure on the plantations from 1860 to the 31st March 1874, a table of income and of the rainfall at Neddivuttum. Also a table showing the number and date of plants placed in permanent plantations.

18. There has been no change in our establishment during the year, and it affords me much satisfaction to be able to state that I have every reason to be satisfied with the zeal and ability displayed by all my assistants; especially by Mr. Rowson, the assistant superintendent at Neddivuttum, Narrainswamy Naidoo, in charge of Dodabetta, and Mr. McNair, the office manager.

19. In

* "In reply to yours of the 20th December, I have to congratulate you on the discovery of the hairy-leaved variety of the *C. Officinalis* which is clearly a great success. We make the contents of the bark of the individual tree growing at N.E. exposure to be a little better than that examined by Dr. De Vrij at at N.W. exposure, but it is possible that if tried by the same person the difference would be not much.

"That sent me gives the following astonishing result:—

Sulph.	Quinine	-	-	-	-	-	-	-	6.00
"	Chinchonidine	-	-	-	-	-	-	-	5.00
"	Chinchonine	-	-	-	-	-	-	-	.60
"	Amorphous	-	-	-	-	-	-	-	.60
									12.20

"Very accurate testing would doubtless diminish a little the quinine and increase the chinchonidine, so that it might be safer to divide the 11 per cent. between them; but even with this deduction it is clear that you have an extraordinary bark, and one which, with its good qualities, throws the *C. Mirabilis* (*Angustifolia*) quite into the shade."

19. In concluding this report, I have to tender my grateful acknowledgments to Dr. DeVry, the eminent Dutch quinologist of the Hague, who, at great labour to himself, has conducted for me minute analyses of 30 samples of bark taken from all our marked varieties growing in various soils and exposures. The analyses of these barks have furnished information of great practical value. To Mr. J. E. Howard, of Lordship's-lane, Tottenham, London, who, from the first, has rendered so much valuable assistance in the development of this undertaking, I am again indebted for the analyses of the bark of *C. Pubescens*, and other important information.

STATEMENT of EXPENDITURE, 1873-74, of the Government Chinchona Plantations on the *Nilgiris*.

PARTICULARS.	Superintendent and Office Establishment.		Propagation and Nursery Department.		Dodabetta Plantation.		Neddivuttum Plantation.		Pykara Plantation.		Mailcoondah Plantations.		TOTAL.
	1860 to 1872-73.	1873-74.	1861 to 1872-73.	1873-74.	1860 to 1872-73.	1873-74.	1861 to 1872-73.	1873-74.	1863 to 1872-73.	1873-74.	1863 to 1872-73.	1873-74.	
Establishment, salaries, &c.	Rs. 89,327	Rs. 8,247	Rs. 40,637	Rs. 240	Rs. 44,336	Rs. 1,980	Rs. 87,807	Rs. 2,532	Rs. 14,516	Rs. 950	Rs. 9,605	Rs. -	Rs. 3,00,177
Buildings - - -	185	380	14,261	-	20,816	-	23,345	461	3,626	147	3,138	-	66,360
Tool and store-rooms -	-	-	-	-	675	-	1,618	-	893	-	320	-	3,500
Coolies' quarters - -	-	-	-	-	1,743	-	4,298	-	2,257	40	545	-	8,880
Felling - - - -	-	-	-	-	4,568	-	9,227	-	7,576	28	4,952	-	26,331
Clearing and weeding -	-	-	1,459	-	22,019	1,650	33,113	1,992	21,397	1,821	11,191	-	93,940
Pitting - - - -	-	-	-	-	9,720	76	15,725	55	6,826	354	4,623	-	37,330
Carriage of plants - -	-	-	-	-	3,427	-	5,048	-	1,823	-	786	-	11,084
Planting and shading -	-	-	-	-	6,934	230	7,419	352	2,222	262	1,117	-	18,538
Trenching - - - -	-	-	-	-	3,759	-	6,642	-	2,065	-	575	-	13,040
Enclosing - - - -	-	-	548	-	5,337	-	4,552	-	1,845	-	1,080	-	13,360
Road-making - - - -	-	-	-	-	7,249	115	5,955	212	3,541	193	2,371	-	19,630
Tools - - - -	-	-	759	-	5,301	61	6,292	95	4,105	75	1,981	-	18,660
Contingencies - - -	1,026	130	2,560	120	6,052	85	7,989	70	2,016	50	1,104	-	21,200
Excavating - - - -	-	-	172	-	1,094	-	1,219	-	-	-	-	-	2,285
Clothing - - - -	201	30	365	-	250	-	381	20	158	-	85	-	1,330
Various - - - -	-	-	-	525	2,795	1,064	3,508	682	840	45	303	-	10,110
Collection of bark and mossing.	-	-	-	-	272	-	3,460	2,000	1,025	595	-	-	7,352
Carriage of ditto - -	-	-	-	-	-	-	762	100	49	148	-	-	1,059
Manure and manuring trees.	-	-	-	-	40	670	28	-	3	-	-	-	7,941
TOTAL - - Rs.	90,739	8,787	60,761	885	1,46,387	5,931	2,28,388	7,871	76,793	4,708	43,776	-	6,75,028

ANCTIONED ESTIMATE, Results of Expenditure, and Out-turn of the Government Chinchona Plantations for the year 1873-74.

	Superintendent and Office Establishment.		Propagation and Nursery Department.		Dodabetta Plantation.		Neddivuttum Plantation.		Pykarra Plantation.		Total	Total
	Esti- mate.	Expen- diture.	Esti- mate.	Expen- diture.	Esti- mate.	Expen- diture.	Esti- mate.	Expen- diture.	Esti- mate.	Expen- diture.	mate.	Expen- diture.
	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>
ishment, including salaries -	8,252	8,247	240	240	1,620	1,980	2,532	2,532	1,020	950	13,674	13,949
ings	250	380	150	-	100	-	150	461	100	147	750	988
and Store Rooms -	-	-	-	-	-	-	-	-	-	-	-	-
es' quarters -	-	-	-	-	-	-	-	-	-	40	-	40
g	-	-	-	-	-	-	-	-	50	28	50	28
ng and weeding -	-	-	-	-	1,900	1,650	1,958	1,292	1,000	1,821	4,858	4,763
g	-	-	-	-	200	76	100	55	300	354	600	485
age of plants -	-	-	-	-	25	-	50	-	100	-	175	-
ing and shading -	-	-	-	-	125	290	250	352	200	262	575	844
-making	-	-	-	-	150	115	200	212	50	193	400	520
-	-	-	10	-	25	61	50	95	50	75	135	231
encies	100	130	100	120	100	85	100	70	100	50	500	455
ing	30	30	30	-	20	-	20	20	-	-	100	50
us	-	-	625	525	1,050	1,064	950	682	300	45	2,925	2,316
ction of bark and mossing trees	-	-	-	-	500	-	1,500	2,000	500	595	2,500	2,595
age of - ditto	-	-	-	-	50	-	150	100	50	148	250	248
re and manuring trees -	-	-	-	-	600	670	100	-	-	-	700	670
TOTAL - - -	8,632	8,787	1,155	885	6,665	5,931	8,110	7,871	3,820	4,708	28,182	28,182

	<i>Rs.</i>	<i>a.</i>	<i>p.</i>
91,773 lbs. chinchona fresh bark supplied to Government quinologist, at 4 annas per lb. -	-	-	22,943 4 -
Ditto - - dry bark for sale in England	-	-	-
1,017½ green tea-leaf distributed to the public, at 1 annas 4 pies per lb. -	-	-	84 12 2
964 chinchona plants, at 2 pies per plant -	-	-	10 0 8
83½ oz. chinchona seeds, at 4 annas per oz. -	-	-	20 14 -
2,030 tea plants, at 10 rupees per 1,000 -	-	-	20 4 9
			23,079 3 7

Ootacamund, 15 June 1874.

REGISTER of Rainfall at Neddivuttum Chinchona Plantation during 1873-74.

Month and Date.				Rainfall.	
				<i>Inches. Cents.</i>	
April	-	1873	-	Rain fall	4 93
May	-	"	-	- ditto	5 92
June	-	"	-	- ditto	17 91
July	-	"	-	- ditto	35 17
August	-	"	-	- ditto	18 30
September	-	"	-	- ditto	15 60
October	-	"	-	- ditto	12 1
November	-	"	-	- ditto	- 79
December	-	"	-	- ditto	- -
January	-	1874	-	- ditto	- -
February	-	"	-	- ditto	- -
March	-	"	-	- ditto	- -
TOTAL - - -				110	63

Ootacamund, 13 June 1874.

Chinchona Plants permanently planted out, Dates of planting, and Number of Acres by base and surface measurement under cultivation of the Government Plantations on the Nilgiris.

DATE.	TOTAL NUMBER SPECIES OF CHINCHONA PLANTS PLANTED.							DENISON, KILGRASTON, AND NAPIER ESTATES, NEDDIVUTTUM.						
	Crown Barks.	Red Barks.	Yellow Barks.	Grey Barks.	Other Species.	Total.	Acres.	Crown Barks.	Red Barks.	Yellow Barks.	Grey Barks.	Other Species.	Acres Surface.	Acres Base.
1862-63 -	18,550	12,500	500	3,100	350	35,000	63	4,200	12,000	500	3,000	300	-	-
1863-64 -	20,432	7,700	1,000	2,500	-	31,632	55	16,000	4,700	1,000	1,500	-	-	-
1864-65 -	56,700	38,500	-	3,512	-	98,719	99	10,000	23,500	-	2,500	-	-	-
1865-66 -	45,500	34,020	-	-	-	79,520	80	2,000	22,720	-	-	-	-	-
1866-67 -	67,000	77,000	9,200	3,140	-	156,340	156	5,000	49,000	8,000	1,140	-	-	-
1867-68 -	150,701	163,800	9,600	14,000	1,600	339,701	340	15,000	94,800	6,200	9,000	-	-	-
1868-69 -	65,000	77,945	7,700	2,500	-	153,145	153	20,000	72,000	7,700	2,500	-	-	-
1869-70 -	84,995	168,473	-	-	899	254,367	254	3,550	70,680	-	-	-	-	-
1870-71 -	-	-	3,500	-	-	3,500	2	-	-	3,500	-	-	-	-
1871-72 -	700	-	2,750	-	800	4,250	5	-	-	2,750	-	-	-	-
1872-73 -	5,961	-	-	-	7,894	13,855	15	-	-	-	-	-	-	-
1873-74 -	15,743	-	-	-	4,686	20,429	-	-	-	-	-	-	-	-
	531,282	579,938	34,250	28,759	16,229	1,190,458	1,244	75,750	349,400	29,650	19,640	300	455	371.24

DATE.	DODABETTA.							WOOD AND HOOKER ESTATES, PYKARRA.						STANLEY ESTATE, MAILCOONDAH.				
	Crown Barks.	Red Barks.	Yellow Barks.	Grey Barks.	Other Species.	Acres Surface.	Acres Base.	Crown Barks.	Red Barks.	Grey Barks.	Other Species.	Acres Surface.	Acres Base.	Crown Barks.	Red Barks.	Other Species.	Acres Surface.	Acres Base.
1862-63 -	14,350	500	-	100	50	-	-	-	-	-	-	-	-	-	-	-	-	-
1863-64 -	2,432	-	-	-	-	-	-	2,000	3,000	1,000	-	-	-	-	-	-	-	-
1864-65 -	32,000	-	-	-	-	-	-	14,700	15,000	1,019	-	-	-	-	-	-	-	-
1865-66 -	39,000	-	-	-	-	-	-	4,500	11,300	-	-	-	-	-	-	-	-	-
1866-67 -	55,000	-	1,200	-	-	-	-	7,000	28,000	2,000	-	-	-	-	-	-	-	-
1867-68 -	105,000	-	3,400	-	1,600	-	-	25,701	54,000	5,000	-	-	-	5,000	15,000	-	-	-
1868-69 -	40,000	-	-	-	-	-	-	-	-	-	-	-	-	5,000	5,945	-	-	-
1869-70 -	49,048	-	-	-	-	-	-	18,297	78,483	-	-	-	-	14,100	19,310	899	-	-
1870-71 -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1871-72 -	-	-	-	-	800	-	-	700	-	-	-	-	-	-	-	-	-	-
1872-73 -	1,000	-	-	-	500	-	-	4,961	-	-	7,394	-	-	-	-	-	-	-
1873-74 -	-	-	-	-	-	-	-	15,743	-	-	4,686	-	-	-	-	-	-	-
TOTAL -	337,830	500	4,600	100	2,950	378	287.25	93,602	189,783	9,019	12,080	336	243	24,100	40,255	899	75	428

ORDER of the Madras Government thereon, 2nd September 1874.

FROM the Report of the Superintendent of Chinchona Plantations it appears that upwards of 20,000 young trees were planted out in 1873-74, and that more than three-fourths were of the valuable variety *C. Angustifolia*.

The superintendent calculates that up to the 1st April last 1,190,458 plants had been planted out in the plantations.

2. The season was exceptionally unfavourable owing to lengthened drought and severe frost. During the year 91,773 lbs. of green bark were supplied to the manufactory at Neddiwattam, and 23,646 lbs. of dry bark were sent to England. A small amount of the bark was collected from three plots of trees which were coppiced after selection by the Government quinologist, but the bulk was harvested under the mossaing process.

The superintendent makes certain calculations as to the cost per pound of thus collecting the bark; but he does not give the data upon which they are based, nor state whether they refer to the Neddiwattam or other estates. In future reports these points should be noticed in full detail, as the cost of collecting moss and other items must vary in different localities.

3. The bark sent to England was sold for 3,490*l.*, or nearly 3*s.* per lb. on an average; it is noted that the prices realised must be considered exceptional, and were due to the bark arriving at a time when it was in special demand. Mossed bark, it is observed, realised considerably more than unmossaed bark.

4. The Government are pleased to learn that a new variety of chinchona, which has been discovered on the plantations, promises to be even more valuable than the *C. Angustifolia* which has hitherto yielded the best analytical results. The attention of the Government quinologist should be again called to this variety on his return, and after submitting its bark to a series of careful analyses he should report the result.

5. The results of the year are satisfactory, and reflect great credit on Mr. McIvor.

— No. 38. —

REPORT on the Number, Distribution, and Condition of Chinchona Plants on the
Nilgiris for the half-year ending 31st July 1874.

Number of Species.	Botanical Names.	Commercial Names.	Number of Plants.	Value per lb. of dry Bark in the London Market.
				<i>s. d. s. d.</i>
1	<i>C. Succirubra</i> - - - -	Red bark - -	1,215,963	2 6 to 8 9
2	<i>C. Calisaya</i> - - - -	Yellow bark - -	54,881	2 10 to 7 -
	<i>C. Calisaya</i> var. <i>Frntex</i> - - -			
	<i>C. Calisaya</i> var. <i>Vera</i> - - -			
3	<i>C. Officinalis</i> - - - -	Original loxa bark -	1,183,159	2 10 to 7 -
	<i>C. Officinalis</i> var. <i>Condamenia</i> -	Select crown bark -	87,509	2 10 to 7 -
	<i>C. Officinalis</i> var. <i>Crispa</i> - - -	Fine crown bark -	4,355	2 10 to 6 -
4	<i>C. Lancifolia</i> - - - -	Pitayo bark - -	279	1 8 to 2 10
5	<i>C. Nitida</i> - - - -	Genuine grey bark -	2,786	1 8 to 2 9
6	<i>C. species</i> without name - - -	Fine grey bark -	8,500	1 8 to 2 10
7	<i>C. Micrantha</i> - - - -	Grey bark - -	46,730	1 8 to 2 9
8	<i>C. Peruviana</i> - - - -	Finest grey bark -	3,389	1 8 to 2 10
9	<i>C. Pahudiana</i> - - - -	Unknown - -	425	Unknown.
10	<i>C. lanceolata</i> -leaved variety of <i>C. Officinalis</i> .	- - - -	15,085	- ditto.
11	<i>C. Pitayo</i> , raised from imported seeds.	- - - -	25,896	- ditto.
12	<i>C. Pitayo</i> plants brought out by Dr. Simpson.	- - - -	76	- ditto.
TOTAL Number of Plants - - -			2,649,033	

TABLE showing the Growth of the different Species of Plants planted out in the Plantations for the half year ending 31 July 1874.

Number of Plants.	Where planted.	Species.	When Planted.	Maximum Growth.	Average Growth.	Height of the Tallest Tree.	Girth near the Ground.
12	Neddivuttum -	<i>C. Succirubra</i> - -	30 Sept. 1862	<i>In.</i> 11	<i>In.</i> 4½	<i>Ft.</i> 32½	<i>In.</i> 28½
12	Neddivuttum -	<i>C. Micrantha</i> - -	30 Sept. 1862	7	2½	31	32½
12	Dodabetta -	<i>C. Officinalis</i> - -	30 Sept. 1863	18	10½	25½	18

TABLE showing the Propagation and Distribution of Plants and Seeds during the half-year ending 31 July 1874.

D A T E.	Total Number of Plants Propagated.	Total Number of Plants Permanently Planted out.	Total Number of Plants Distributed to Private Individuals.	Total Quantity of Seeds Distributed.
February 1874 - - - -	380	- - - -	- - - -	<i>Oz.</i> 9
March 1874 - - - -	1,260	- - - -	- - - -	8
April 1874 - - - -	-	- - - -	- - - -	-
May 1874 - - - -	780	- - - -	- - - -	1
June 1874 - - - -	540	- - - -	8,000	2
July 1874 - - - -	700	- - - -	32,100	-
Total - - - -	3,660	- - - -	40,100	20
Previously - - - -	2,645,373	1,190,458	194,491	449½
GRAND TOTAL - - -	2,649,033	1,190,458	234,531	469½

REMARKS.

The number of plants propagated during the past half-year is 3,660, viz., 3,360 of *C. Angustifolia* (var. *Lanceolata*) and 300 of *C. Pitayensis*.

Forty thousand one hundred chinchona plants have been issued to the planters in Ouchterlony Valley and Wynaad.

Twenty ounces of chinchona seeds have been supplied to the public.

Six hundred and eighty lbs. of green tea leaf have been furnished to Major Jennings.

Three thousand and forty-seven lbs. of trunk and 34,488 lbs. of branch bark have been supplied to the Government Quinologist since April last for the manufacture of amorphous quinine.

Ootacamund, 3 September 1874.

ORDER of the Madras Government thereon, 25 September 1874.

Ordered to be forwarded to the Secretary of State, to the Supreme Government, and other governments in India, to the superintendent of the chinchona plantations in Java, and to Mr. W. F. M. Dennison, Batavia, Java.

2. A copy will also be laid on the editor's table.

— No. 39. —

(No. 3—Revenue.)

From the Secretary of State for India to the Government of Madras.

My Lord,

India Office, London, 28 January 1875.

Para. 1. I have received and considered in Council your Excellency's Despatch, dated 30th October (No. 25) 1874, forwarding the Report on the Nilgiri Chinchona Plantations for the year 1873-74; but I am not yet in receipt of the detailed report on the results of the alkaloid manufactory, with regard to the quantity produced, the price, the efficacy of Mr. Broughton's preparation, and the extent to which it has been used by the Government Departments and by the public.

2. The best method of harvesting the bark is still undecided, and it is important that both the mossing and the coppicing systems should have a fair trial, in order that a definite conclusion may be reached after careful scientific investigation. Yet I observe that only a small amount of bark has been collected from coppiced trees, while the bulk was harvested under the mossing process. I shall be glad to be informed why, so early as in July 1871, the supply of bark for the alkaloid manufactory was ordered to be obtained by mossing, while, contrary to the advice of the quinologist, the coppicing system has been tried to so small an extent. If, as Mr. Broughton reports, the appearance of the alkaloids in the renewed bark is attended with a considerable impoverishment in the alkaloid content of the old bark remaining on the tree, it is a very serious matter that so large an extent of the plantations should have been given up to the mossing system.

3. I think it necessary to request the serious attention of your Excellency's Government to the importance of not allowing either plan to preponderate until a really decisive conclusion has been reached with regard to their respective merits.

4. I desire that copies of any report that may have been made by Dr. Bidie, after his examination of the plantations, may be transmitted to me, together with the report, already called for, on the manufacture of the so-called amorphous quinine.

I have, &c.,
(signed) *Salisbury.*

— No. 40. —

(No. 6—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Marquis,

Ootacamund, 9 March 1875.

IN a Despatch from your Lordship's predecessor, dated the 16th December 1873,* information was asked for with reference to the cost and efficiency of the "so-called Amorphous Quinine" manufactured on the Nilgiris under the supervision of the Government Quinologist, and to its influence in reducing the indents for quinine and other alkaloids, and also as to the cause of the cheaper alkaloids being indented for in very small quantities.

* Revenue, No. 25.

2. We have now the honour to forward two reports from the Government Quinologist detailing his mode of manufacture and his estimate as to the cost of the product, together with a report from the Surgeon General showing the quantities issued and the results obtained where its efficacy was tested.

Dated 1st December 1873, and 14th March 1874, recorded in G.O., 1st April 1874.
Proceedings of Government, 9th March 1875.

3. After the receipt of these reports, we saw reason to entertain some doubts as to the working of the factory, and therefore deputed the Commissioner of the Nilgiris and the Sanitary Commissioner to inquire and report on the cost and medicinal value of the product. These gentlemen, having visited the plantations and the factory, examined the quinologist, Mr. Broughton, and the superintendent, Mr. McIvor, and had before them the reports adverted to above, have now submitted a most valuable and lucid report which is incorporated and reviewed in our proceedings marginally noted. They have satisfactorily demonstrated that, while the present prices of chinchona bark obtain, the local product is being manufactured at a considerable loss, and that its commercial value is less than one-half the value of the raw material and manufacturing charges, the value being less than 1,500 £. and the cost rather above 3,000 £. They state that its efficacy as a febrifuge is undoubted, and this is supported by the record of cases treated with it, submitted by the Surgeon General; but they also show that, as at present prepared from different barks, it is "always varying in composition," and the process of manufacture does not extract from the bark a yield at all approximating to the estimated amount, as calculated by analysis of samples of the bark used.

Proceedings of Government, 22nd June 1874, with Proceedings of Government, 15th December 1873.

Dated 11th February 1875.

4. As, therefore, it appears to be conclusively shown that the manufacture is being carried on at a very serious loss to the public revenue, we have directed it to be for the present wholly discontinued, and now forward all the papers for your Lordship's information.

5. We especially desire to call attention to paragraphs 9 and 53—57 of the joint report. In the former it is suggested that information as to the buyers of the bark sent to England might, in future, be advantageously communicated; and, in the latter, it is pointed out that, while the therapeutical value of mixed alkaloids is beyond question, the framers of the British Pharmacopœia, by insisting on the separation of quinine, have led to the waste of large quantities of associated alkaloids. Such a separation being unnecessary, and an important element in determining the price of the recognised febrifuge, we would support the recommendation that a reference should be made to the Royal College of Physicians, with a view to obtaining their influence in support of the recognition of some preparation of mixed chinchona alkaloids, which shall be popular in form and an inexpensive but effective febrifuge.

6. On the other points noticed in the Despatch, we have to state that the use of the locally manufactured product has undoubtedly contributed to lessen the quantity of quinine and other alkaloids indented for, while the cause of what are now the cheaper alkaloids not having been used is to be found in the fact that when, owing to their therapeutical value having been established, indents were made for supplies, "the prices charged in the case of chinchonidine and quinidine were actually higher than the current rates for sulphate of quinine."

7. We shall shortly address your Lordship regarding the appointment of Government Quinologist, the present incumbent having resigned and his resignation having been accepted.

We have, &c.
(signed) Hobart, &c.

Enclosure 1, in No. 40.

From the Government Quinologist to the Secretary to the Government, Revenue Department, Fort St. George; dated Ootacamund, 1st December 1873.

Subject of report.

I HAVE the honour in the following pages to make a report on the manufacture of alkaloid from the Chinchona bark of the Nilgiri Government Plantations, the reasons for my adoption of that form of febrifuge alkaloid, named by the late Inspector General of Hospitals "Amorphous quinine," and the mode of preparation of that substance, together with the present results from the manufactory at Neddivuttum. In this report I will briefly recapitulate former statements and proceedings, in order that Government may have the matter fully before them.

My original instructions.

2. My instructions from the Home Government, given in September 1866, with reference to this part of my duties, are as follows (Chinchona Return, 1870, page 4), "Finally, it will be expected from the chemist that he should, through his investigations, enable Her Majesty's Government to arrive at a decision with respect to the best and cheapest method of preparing the febrifuge for use among the labouring classes of the natives of India. He will also be required to consider the question connected with the manufacture of the chinchona febrifuge for the use of hospitals and troops in India.

Alkaloids of red bark mainly not quinine.

3. Two years after my arrival in this country, I obtained, by experience, a knowledge of the advantages and defects of the chinchona species cultivated on the plantations. That of which the largest number of plants was cultivated was the *C. Succirubra*. This species has by far the most vigorous growth, and still forms the most considerable part of the plantations. Though when young its bark yields much quinine, experience shows that the amount of this alkaloid diminishes with age. The main alkaloids of this plant, however, are chinchonidine and chinchonine. In gross amount of alkaloid in its bark, this species is surpassed by few others. I became convinced from the small amount of quinine this species yields, and the difficulty with which it is obtained in a pure form, that the red bark offered the least prospect of profitable demand by the European quinine manufacturer. I have, therefore, done my best in all reports to check its cultivation, though in this respect I have been somewhat ineffectual, until too large a number had been planted. My estimate of the final low market-value of this species is quite unchanged.

Influence of reports of the Chinchona Commission.

4. The reports of the Chinchona Commissioners in this and other Presidencies have, however, conclusively shown that the other chinchona alkaloids possess a febrifuge power little, if at all, inferior to that of quinine. This conclusion, though it was fully expected on chemical and historical grounds, is of the highest importance. It was this that led me to the adoption of the bark of *C. Succirubra* as a satisfactory material for the preparation of a febrifuge which would be as effective as quinine sulphate.

Reasons for manufacturing alkaloids in India.

5. The grounds on which I have long concluded that the febrifuge employed in the hands of Government for use in India can be more cheaply prepared in this country, have already been communicated (my letter attached to G. O., No. 249, of the 7th February 1871). They are briefly these: the alkaloids are extracted with somewhat greater ease from the fresh green bark, than from dry. The necessity of drying, powdering, and the freight of the bark to Europe, is saved. The supply being in the hands of Government, allows a rougher, and, therefore, a cheaper, mode of manufacture being adopted, than is usual in Europe for the preparation of the alkaloid sulphates. Against these, there are, of course, considerable difficulties to be expected in the carrying out of any systematic process worked by natives, from the lonely situations of the plantations of red bark, and the annoyances that consequently arise in such an undertaking in a manner almost peculiar to this country.

Therapeutical considerations and results.

6. The actual chinchona bases being, of course, the active medicinal constituents in the sulphates or other salts employed as febrifuge, it was necessarily believed that the bases themselves would be as effective medicines as these salts. The considerable amount of tinctures and extracts of chinchona bark still employed in medicinal practice clearly show the efficacy of salts other than sulphates; nor, as far as I could learn, do the preparations made from chinchona bark destitute of real quinine, show any failure in febrifuge efficacy, a fact readily explained by the results of the Madras Chinchona Commission. Pure quinine sulphate contains but 73.55 per cent. of quinine. It was, therefore, believed that a preparation of the chinchona alkaloids, in the proportion that they naturally exist in the barks, which would contain about 97 per cent. of the pure bases, would admit of exactly the same medicinal doses being employed as of quinine sulphate. If there should be, for which there is no evidence, a somewhat inferior febrifuge quality in the alkaloids other than quinine, this would, it was believed, be compensated for by the larger amount of the real bases in the preparation in comparison with quinine sulphate. The report of the Medical Inspector General, attached to G. O., No. 29, of the 11th January 1871, appears subsequently to corroborate these suppositions, as he states it to be "a remedy in malarious fever, scarcely, if at all, inferior to quinine." The evidence for the belief expressed

expressed by the Government of Madras in paragraph 3 of G.O., No. 714, of the 9th July 1873, I am unacquainted with.

7. Before describing the method of preparation I have adopted for the manufacture of the chinchona alkaloids I believe it will be of service if I detail with brevity various modes of preparation which it was necessary to try and the objections that have arisen to each.

Methods of manufactures considered.

8. In a report appearing in Return on Chinchona Cultivation, 1870, page 243, paragraph 54, and more fully in a memoir in Phil. Trans. Roy. Soc., 1870, I show that six-sevenths of the alkaloids in the bark of *C. Succirubra* occur in the form of quinotannates. As this salt is nearly insoluble in water, the presence of a strong acid is necessary for its decomposition and complete solution of the alkaloid. It is this circumstance which constitutes the main difficulty in the preparation of alkaloid, since, even after the tannates have been decomposed in hot or dilute solutions, they partially re-form when the same solutions become cold or are increased in strength.

Alkaloids exist in bark as insoluble quinotannates.

9. A method which has actually been employed in European manufactures, and which possesses great simplicity, is the percolation of the dried and powdered bark by cold dilute acid and the precipitation of the alkaloid by caustic soda. It will be perceived that this method either compels one to forego the advantage of obtaining the bark in its fresh, green state or renders a complete preliminary crushing necessary. I, however, carefully and repeatedly tried the method. The objections to it were that a large and expensive amount of acid was necessary for the nearly complete extraction of the alkaloid, which had subsequently to be neutralised with soda, and that on a manufacturing scale only two-thirds of the total amount of alkaloid was ever obtainable, and then not by any means in a pure state. The concentration of the bulky solution by evaporation increased the latter evil. In India the utmost possible economy in the use of acid is necessary.

Method of percolation with dilute acid.

10. I may here state that I prepared the crystallised sulphates of quinine and cinchonidine from fresh red bark by digestion in the cold with dilute sulphuric acid and neutralization and evaporation of the extract. It was with great regret that after much trial I found it impossible to obtain more than a quarter of the total sulphates by this very simple method.

Crystallized sulphates of quinine and cinchonidine can be obtained by the foregoing method modified.

11. A method of manufacture which, though I finally abandoned it, has the great advantage of not requiring the use of alcohol may be here briefly described. An extract is made by boiling the bark in the usual manner with 4 per cent of sulphuric acid. When the bark is exhausted the extracts are evaporated to dryness, and kept for half an hour at a temperature of 120° C. This completely decomposes the quinotannic acid. The solid residue is powdered, exhausted with water filtered, and the alkaloid precipitated with caustic soda. It is thus obtained tolerably pure, though one-third of the amount is lost, and much of the alkaloid is converted into the non-crystallisable isomerides.

Method by heating the extract to 120° C.

12. The method of Clark and many others were also carefully and quantitatively tried, but the result led to their abandonment. Mineral oils, &c., were also experimented with to use in the place of alcohol, but without economical success.

Clark's and other methods.

13. The method of Delondre, which, before I came to India, had been tried by Mr. Markham (for the preparation of "quinium") was also fairly tried by me (Chinchona Return, 1866, page 218). It consists in mixing the powdered bark with calcic hydrate and water, drying and exhausting with alcohol. Nearly the whole of the alkaloid is thus obtained mixed with much resin and calcic salts, from which, however, it can be afterwards purified. The necessary preliminary fine division of the bark is a disadvantage of this process, but the most serious is the waste of alcohol which it entails, it being found very difficult to wash out the spirit from the spent bark as the latter swells up immediately water is applied. In extremely rich barks the method would be applicable, but with poor barks the great waste of spirit in proportion to the amount of alkaloid obtained renders the method quite unfit for the preparation of a cheap febrifuge. It consequently had to be abandoned, as I believe is now the case in the Havre manufactory.

Delondre's method.

14. The method I have adopted is quite similar in principle to the usual method that, since the time of Pelletier, has prevailed in manufactories of Chinchona alkaloids. It consists in precipitating the alkaloids in an insoluble state, and subsequently separating them from the mass of impurities with which they are mixed by solution in alcohol. The method is, however, so contrived that the very cheapest materials are used and the greatest economy is practicable with those materials which are not found on the plantations. The only material of which the consumption is large is that of wood fuel, which some years ago it was believed would be furnished in any amount by the chinchona plantations by trees which had been coppiced. This, however, has not been the case, owing to the adoption of Mr. McIvor's system of mossing, respecting which I have already expressed an opinion which I need not further reiterate.

Principle of method in use.

15. The process was first tried in my small laboratory at Ootacamund, and I found that from 80 to 95 per cent. of the total amount of alkaloid in the bark was obtained by

Experimental results of method.

it. If done with analytic precision, which, of course, cannot be practically carried out in a manufactory, 97.1 per cent. of that amount is obtainable, though I have never obtained this result when working with native coolies, but only when the work was performed by myself or by my laboratory assistant.

First trials of manufacture.

16. The first product of this process, named by the late principal Medical Inspector General "Amorphous quinine," was prepared in the small experimental manufactory erected at Ootacamund, where enough was prepared from red bark grown at Neddiyuttum for a fair trial of its medical efficacy. The results of its medical trial are contained in a report of the Principal Medical Inspector General attached to G. O., No. 29, of the 11th January 1871, which was considered highly favourable.

Description of method now employed. Extraction of bark.

17. I will now describe the method of manufacture I have adopted, which though in the course of work has been constantly modified and improved, is, of course, susceptible of further improvements in detail.

The bark, in long strips, exactly as taken from the tree, is placed in a copper pan with $1\frac{1}{2}$ per cent. of sulphuric acid* and a quantity of water that has already been used for the fourth extraction of nearly spent bark boiled for an hour. The liquid and bark are then separated by a strong pressure in a screw press, the former falling in a wooden vat placed underneath. The squeezed and nearly dry bark is again boiled with liquid that has been used for a third boiling of other bark and another half per cent. of acid is added. After an hour's boiling it is again squeezed; it is then again boiled with a liquid that has come off nearly spent bark, again squeezed, and finally boiled with water. During these four boilings, the bark, after each squeezing, diminishes greatly in bulk, and becomes almost pulp, so that it occupies far less room in a pan at the third boiling to what it did at the first. The order in which the several liquids used in extraction are employed depends on the qualities of bark under manufacture; but it is so arranged as to obtain finally a liquid containing as much alkaloid as possible in solution, and also that, as far as possible, the bark should be exhausted of alkaloid. Finally, there arrives a point when the amount of alkaloid in the bark has become so small as not to repay the expense of further extraction. The bark then is dried in the sun, and used as fuel.

Precipitation of extracts with lime.

18. The liquid, which, if the foregoing be judiciously managed should be intensely bitter and strong, is evaporated to about one-sixth of its bulk, transferred to a tub, and allowed to cool. It is then decomposed by neutralization with milk of lime which precipitates the alkaloids, decomposing the quinotannates and sulphates with formation of insoluble lime salts. A slight excess of lime is always added. After standing for a day the precipitate is separated by filtration, squeezed, dried, and powdered in a common ragi mill. The liquid, which contains abundance of calcic quinate in solution, is thrown away.

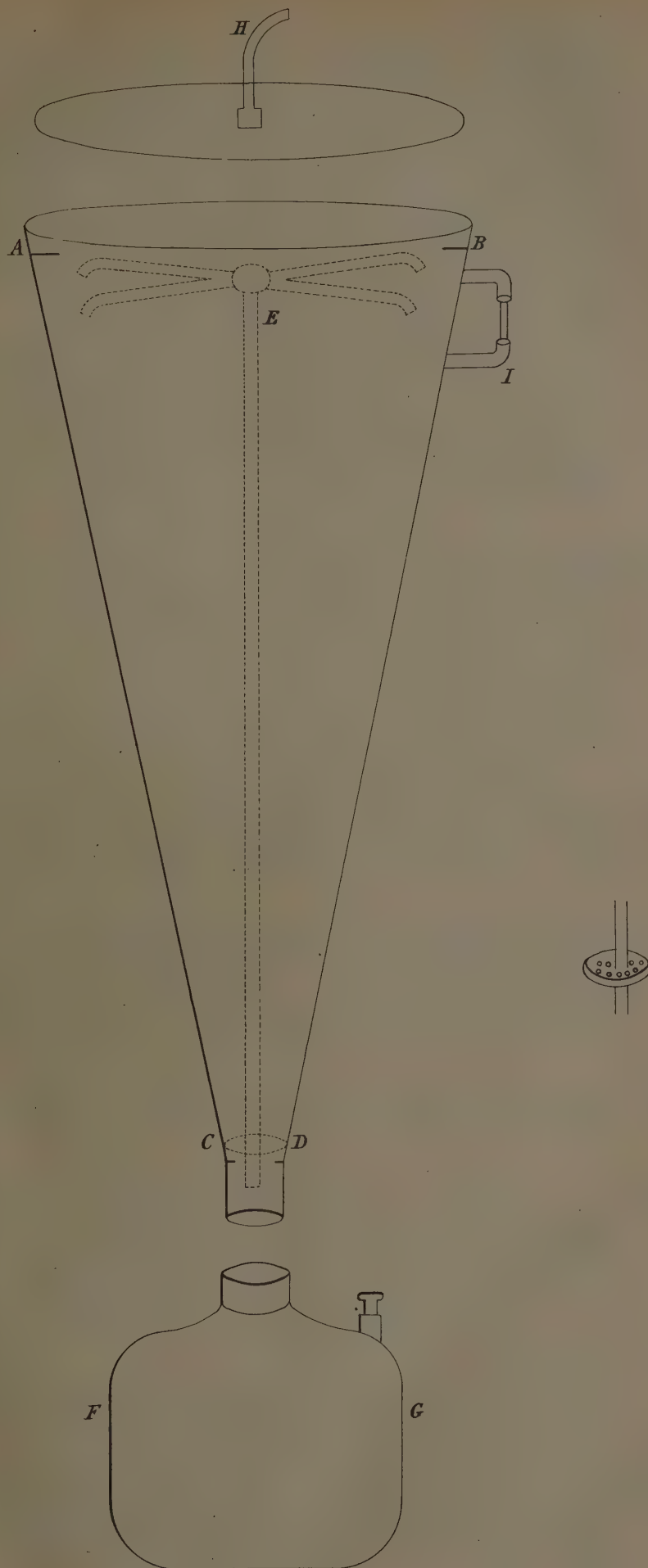
Evaporation was at first dispensed with. Necessity for the use of lime.

19. As first conducted, the evaporation mentioned in the foregoing paragraph was omitted, the precipitation being at once performed in the original liquid. But, as alkaloid is unfortunately slightly soluble in lime-water, this proceeding was found to produce considerable waste, and therefore it was found necessary to evaporate in order to reduce this waste to a minimum. In India lime must necessarily be the precipitant as it is by far the cheapest of all the alkaline bases. I have tried both English caustic soda and Indian soudoo as precipitants of the alkaloid, but for many reasons do not now employ them.

Proceedings employed to exhaust with alcohol.

20. The powdered lime precipitate is then packed in the apparatus, of which a drawing is given, ABCD, being a large cone of sheet-iron, through the centre of which passes an upright tube, the upper end of which terminates in a cross-piece with four openings. The lower end of the tube is also open and supplied on a flat perforated circular disk (CD) made of sheet-iron. This allows it to rest in the cone. Below, and tightly fitting to the lower part of the cone, is an under copper vessel (FG). The cone is supported by chains, and above it is placed in connection with the lower end of a simple worm-tub (not shown in the drawing) by means of a tube (H). The powdered lime precipitate is filled in the cone till immediately under the cross tube (E). The upper lid of cone is fitted on and alcohol poured on till, by passing through the precipitate, the lower vessel becomes about a third full. The spirit is then saturated with alkaloid, which is neutralized with care by diluted sulphuric acid of which the strength is known. Then the upper lid of the cone is put into connection with the upper condenser by the tube E, and a fire is lighted below. The spirit boiling in FG rises in vapour through the inner tube, and passes out at the four openings of the cross-piece. It here generally condenses to a liquid, but if not, it passes into the copper condenser, where it, of course, condenses, so that by a judicious arrangement of the fire a layer of liquid is kept on the surface

* This is the amount of acid employed for *trunk* bark, for *prunings* but one per cent. or even less is ordinarily used.



surface of the precipitate. A gauge (BI) allows this to be seen from the outside. If the fire is, however, kept too fierce, no harm can ensue, since, if the layer of liquid rises in consequence higher than the percolation through the precipitate removes it, it simply passes down through the centre tube into the lower vessel. Hence the apparatus is self-acting, and the cooly workpeople have no connection with the alcohol, which is all inside the apparatus. A small amount of alcohol by constant circulation through the apparatus thus completely dissolves the whole of the chinchona bases without any waste of spirit or alkaloid. Every two days the alkaloid is neutralized with dilute acid. If this be done with moderate care there is no chance of the copper under vessel being in the least attacked, but if very carelessly done a mere trace of oxide of copper is dissolved. This, however, rarely occurs; but, if it does, it is readily remedied subsequently.

21. The fire is thus kept up until the whole of the alkaloid is dissolved and passes into the lower vessel. This state of things is known by the alkalinity of the liquid in the lower vessel not increasing. But to make sure the spirit dropping from the cone is usually tested when the process draws near its end. When finished, the exhausted precipitate does not contain a trace of alkaloid, all being in the lower vessel. The lower vessel is then removed, and the alcohol separated by distillation. Water is also poured on the cone, in order to wash out the alcohol with which the precipitate is still moistened, until the latter is quite removed. The alcohol is thus nearly all recovered, and is purified for another operation by distillation. With care, waste of spirit practically does not occur, but I have been unable yet to prevent all loss of spirit from the carelessness with which every operation in this country appears more or less attended. The loss, however, has not exceeded 6 per cent., and has fallen frequently much below this.

Recovery and actual waste of alcohol.

22. The alkaloid sulphates in the lower vessel is suddenly diluted with about 10 times its bulk of cold water. This separates a considerable amount of black resin. Since the contamination of copper occurred in Bengal in the alkaloid, I have always as a precaution added a small amount of a dilute acidulated solution of sodic sulphide to the liquid. This completely removes copper if it be present, though with very moderate care it is completely unnecessary. The solution is still, however, coloured with impurities, to remove which a small amount of alkaloid is precipitated by the addition of dilute caustic soda, which carries down with it the colouring matters. The whole is then filtered through a cloth bag, and the alkaloid in the filtrate is precipitated by caustic soda, separated by filtration, squeezed, dried, and powdered. It is then "amorphous quinine." Before it leaves the manufactory as a precautionary measure it is always tested for copper.

Purification and precipitation of alkaloid.

23. Formerly, from the ashes of the fuel employed, caustic potash was prepared to use as precipitant instead of soda. But lately so small an amount of potash has occurred in the ashes that this has been discontinued. If the chinchona wood from coppiced trees was employed as fuel this might be again resumed and thus a further saving effected.

Potash should be obtained from ashes of fuel.

24. Sulphuric acid has been used in preference to hydrochloric acid, mainly because it is the cheaper acid. While the cost is nearly the same the effective work produced by the sulphuric acid is nearly double that of hydrochloric acid for equal weights. It has also some better qualities for transit through the tropics. The use of sulphuric acid has also some chemical advantages which I need not further particularise. With red bark there is unfortunately no fear of the sudden crystallization of quinine sulphate on the dilution mentioned in paragraph 22 as there would be with crown bark.

Why sulphuric acid is preferred for extraction of bark.

25. The alkaloid which is carried down in connection with the precipitated resin, and in the purification by fractional precipitation, is, of course, from time to time obtained free from impurities by the obvious methods of drying and digestion with dilute acids &c. Thus obtained it is generally very pure and colourless.

Alkaloid contained in the resin is not wasted.

26. Throughout the whole course of manufacture simplicity of arrangement has been carried out as far as possible. The reasons for this are—

Simple apparatus throughout have been preferred.

1st. That certain labour-saving appliances which are used in England would here be a source of considerable expense and are obtainable with great difficulty and delay. Until alkaloid manufacture in South India has proved itself a permanent success, I have, therefore, felt it wiser to refrain from all dispensable expenditure for apparatus for which simple substitutes could be provided.

2nd. That the simpler the apparatus the more readily are they repaired, when necessary, in India.

3rd. The intelligence of Canarese coolies on the Nilgiris is fully exercised by the simplest proceedings of manufacture, therefore any increase in their apparent complexity has to be made with a risk of loss and injury to the apparatus.

27. The whole of the trunk bark supplied to the manufactory during the year 1872-73, has been obtained under the mossing system which has virtually been adopted by the Madras Government. This method of cropping bark has the disadvantage of only permitting the supply of good bark to be furnished during the two months at the beginning and the two months that end the monsoon. Hence during that time the pressure of work is very considerable, while during the remainder of the year it is very light, so that I

Trunk bark is only supplied at beginning and end of monsoon.

have been glad at the latter period to work with very inferior prunings, for the purpose of keeping the establishment employed, although I knew such bark could not be worked with profit.

Plantations have not supplied fuel for manufactory.

28. Though I am aware the refraining from coppicing cannot be permanent, it has had a further result for which at the commencement of manufacture I was unprepared. At that time I believed the supply of fuel from the plantation would be unlimited from the coppicing of the trees. But up to the present time, as coppicing has not been practically carried out, no fuel has been obtained from the chinchonas. The fuel hitherto employed has been furnished by the trunks and branches of trees that once formed part of the original shola on whose site the plantations were formed, and now lie among the chinchona-trees. In a short time this source of fuel will be exhausted, and is now a more costly fuel than chinchona-wood would be.

29. I will now state the results that have been obtained in the year 1872-73 in the manufacture of chinchona alkaloid and the actual cost of preparing the same.

A correction of the amount of bark supplied.

30. I should state that a more recent examination of returns has shown that the 3,613 lbs. of officialis prunings mentioned in my annual report (paragraph 2, G. O., No. 714, of the 9th July 1873), had previously been included in the 46,440 lbs. stated as red-bark prunings, and thus were mentioned twice over. The correction will, therefore, reduce the total amount of bark supplied to the manufactory by 3,613 lbs. I correct this for the sake of accuracy, though the difference to the amount of alkaloid due is but $4\frac{1}{2}$ lbs.

Superintendent's pay not charged in subsequent expenses.

31. I have the honour to give in Appendix to this report a statement of the actual expenditure subsequent to last official year that has been necessary to work up the unfinished product of that year, which was in the state described in paragraph 18, or lime-precipitate. The pay of the superintendent is not included, as during the time he has been mainly occupied in extracting fresh bark, and during the early part of 1872-73 he might have been similarly occupied in working up the lime-precipitate of the previous working season, had any remained. Every real expense has, however, been charged that has been required for the preparation of the alkaloid fit for sending to the Medical Stores, Madras. No repairs of apparatus have been required. All the resin, fractional precipitates, &c. have had the alkaloid separated in order to ascertain the true result of the work of 1872-73, so that nothing is assumed on estimate.

Amount of amorphous quinine obtained from lime-precipitate.

32. From the lime-precipitate obtained during the last official year that remained for exhaustion with alcohol 130 lbs. and 11 oz of "amorphous quinine" have been obtained. This is less than I at first expected and stated in my annual report. My estimate was founded on the amount of lime-precipitate that required treatment, the yield of which was fairly assumed to be the same as that worked up in the year. I therefore hoped that a quantity of alkaloid not very far below the theoretical amount would be obtained. I now find that lime-precipitate from poor prunings, like those worked up during the latter part of last year, contains far less alkaloid than that obtained from good bark. The extra expenditure necessary for obtaining this 130 lbs. and 11 oz. is, however, but small, being but 1 anna and 8 pies per ounce.

Theoretical yield of total bark supplied.

33. In order to determine the true total yield of the barks that were supplied in 1872-73, I have placed in Appendix the results of the many analyses that have constantly been made during the year. These have been performed, as far as possible, on a carefully selected average sample of each kind supplied. The results of this multiplied by the respective weights of the barks will express closely the total yield of the bark supplied. The total shows that 537.9 lbs. was contained in the whole of the bark. The total weight of alkaloid obtained in manufacture is 345.68 lbs.

Analytical results can never be obtained in manufacture.

34. It must not be supposed that it is possible, in manufacture, to obtain the same results as are obtained in analysis, as analytical methods of procedure cannot be carried out on a large scale, even if the cost permitted. Whether manufacturers, however, compared the theoretical yield of total alkaloids in the bark worked with the actual amounts they obtain in manufacture I do not know, but there is no record of their having done so. Quinine manufacturers are only specially interested in obtaining all the quinine from the bark, and would have no great care for the other alkaloids, which at the time I left Europe usually accumulated on their hands unsold. It is therefore probable that a comparison such as I have made is made for the first time. It is on this account I have been anxious to have it as complete as possible, and hence the delay in the submission of this report.

Sources of waste of alkaloid in manufacture.

35. I will indicate the sources of the loss of alkaloid which occur in the manufacture, nearly the whole of which are preventible only at a greatly increased cost of labour and product:—

1st. The not quite complete exhaustion of the bark of alkaloid on first extraction with acidulated water. Usually, the bark at the end of the boilings described in paragraph 16 of this report still contains a small amount of alkaloid which another boiling

boiling and squeezing would remove. This is not now performed, as the small amount of alkaloid obtained would not repay the cost of the labour, fuel, and subsequent evaporation.

2nd. Spilling and waste of extract, and occasionally of bark itself, by the carelessness and indifference of the coolies. This is not preventible in India.

3rd. Waste of material in grinding the lime-precipitate and in final powdering of the alkaloid. This may, with care and training, be diminished, but cannot entirely be obviated.

4th. The solubility to a small extent of the alkaloid in lime-water. At the beginning of the year 1872-73 loss from this source occurred. It has since, as I have before mentioned, been prevented by the evaporation of the liquid extract of bark down to a small bulk, before the precipitation with milk of lime is performed. I cannot fairly estimate the amount of waste that has occurred from this source, but believe it will not have exceeded 20 lbs. of alkaloid.

36. As a measure of precaution I have repeatedly tested whether the lime-precipitate is completely exhausted of alkaloid by the alcohol before throwing it away, and have always found that no alkaloid is wasted by imperfect exhaustion, as might otherwise be naturally supposed.

37. I will now state the total cost of manufacturing the alkaloid. In Appendix I give a statement of all the expenditure connected with the works for the working-up of the bark supplied during the year 1872-73. This excludes the cost of apparatus and repairs, the latter expense being, however, but small. It also excludes my own pay, as manufacturing work can go on, after once established, under the superintendent, without the necessity of a chemist's intervention. During the year my time has been more occupied with other duties than with the alkaloid works at Neddivuttum, which I visit but weekly.

Quinologist's pay excluded from manufactory expenses.

38. The total expenses, therefore, have been Rs. 2,823. 11. 9., and 345 lbs. and 11 oz. of amorphous quinine have been obtained. This shows that the expense of preparing each ounce has been 8 annas and 2 pies. This does not, of course, include the cost of the bark, but is that of manufacture only. This cost is within my original estimate (letter attached to G. O., No. 249, of the 7th February 1871). This estimate was framed on the assumption that 800 lbs. were manufactured, and that the bark worked had a mean yield of 4 per cent. of alkaloid when dry. The bark supplied in 1872-73 has had a mean percentage of scarcely three, on account of the large quantity of nearly worthless bark from prunings supplied during the dry weather, which frequently contained but 0.5 per cent. of alkaloid when dry. The results of manufacture on the score of cost appear, therefore, satisfactory.

Cost of manufacturing per ounce of alkaloid.

39. G. O., No. 714, of the 9th July 1873, does me the honour of requesting my matured opinion on the expediency of manufacturing any febrifuge in this country. Before expressing this I beg respectfully to make some remarks on paragraph 3 of the same Government Order.

Requests leave to discuss Government Order.

40. In this paragraph it is accurately stated that 1 s. per pound may be taken as the value of (green) red bark, basing this estimate on the Despatch from his Grace the Secretary of State, recorded in G. O., No. 1,429, of the 16th October 1872, in which it is stated that (commercially dry) red bark sold at from 2 s. 1 d. to 3 s. 1 d. per pound in England. This, of course, would be the value of the dried and packed bark after conveyance home. But if the manufactory be charged English price for bark grown on the spot in India, it will follow that the febrifuge must be produced at something near the English price of quinine sulphate, or, as the Government Order states, the cost of the alkaloid will be Rs. 3. 9. 6. per ounce. The present English price of quinine sulphate is 9 s. 6 d. per ounce, or roughly Rs. 4. 12. If the Madras Government, therefore, desire the profit on the sale of chinchona-bark at the present English prices, it must not expect at the same time a febrifuge for Indian use at the price of one rupee per ounce.

Value of bark attributed.

41. I will again state the reasons that to me appear convincing why the present English price of red bark cannot continue. This bark, whether renewed under moss or not, is nearly unfitted for the manufacture of quinine, as it contains so little, and that little is difficult to obtain as crystallised sulphate. It is used for the manufacture of tincture and other pharmaceutical preparations. I am informed, on good authority, that annually 100,000 lbs. of chinchona-bark are used for these purposes in England. Without counting the Government plantations, the private plantations of the Nilgiris contain nearly a million and a half of trees of *C. Succirubra*, which will in a short time supply at least 15 times that amount annually. To this must be added the yield of the private plantations in Bengal and in other parts of the world. I cannot but conclude that with this enormous supply the price of red bark must very shortly fall in the English market, till it only just pays for the cultivation and export. It is quite possible that the employment of chinchonidine and chinchonine in medicine may hereafter give red bark a certain manufacturer's value, but much time must elapse first. At the present time the qualities of Indian red bark are scarcely known in England, but they will shortly become so. The foregoing are, therefore, the reasons, as I before stated, on which my choice of the form of febrifuge and the bark from which it is to be obtained are mainly founded.

Reasons why the price of red bark will decline.

English prices of bark incompatible with cheapness of febrifuge.

42. But for a short time to come the value of the bark attributed to it by Government will doubtless be the main influence in their estimates of the expediency of manufacture in South India. In all papers previous to G. O., No. 714, of the 9th July, it appears to be implied that the actual cost-price of the bark on the plantations should be the element of cost in that of the alkaloid. If the present prices obtained by the sale of bark in England be debited to the alkaloid manufactory for its raw material, it is quite clear that a cheap febrifuge will be impossible, and I could have positively stated this before coming to India. The profits of sale and cheapness of febrifuge cannot coexist. If all the bark whose alkaloids will finally be used in India be exported, the additional and apparently unnecessary labour of drying, packing, transport, and sale of bark will be taken, and the advantage of the control of manufacture will be sacrificed which permits a more abundantly occurring form of febrifuge to be used in India. It is for His Excellency the Governor in Council to determine whether the profit of sale of red bark in England or cheapness of febrifuge for use in India be the end to be obtained.

Manufacture to some extent must continue.

43. My matured opinion, therefore, does not differ from the one I formerly expressed concerning alkaloid manufacture in India (letter recorded in G. O., No. 219, of the 7th February 1871). But, under any circumstances, as long as Government export red bark, advantage will be found in having some means of obtaining the alkaloid contained in the bark of prunings and waste bark that is not worth carriage to England, which must always occur on the plantations in considerable quantities. Therefore, if my opinion is not held by Government, the small manufactory now established in action will still have work.

Suggests further medical report on amorphous quinine.

44. I would suggest that, if any doubt is felt of the medicinal efficacy of amorphous quinine after the original report of the Inspector General of Hospitals, recorded in G. O., No. 29, of the 11th January 1871, that a further expression of the opinion of the medical authorities on the same should be called for by Government.

APPENDIX.

Cost of Alkaloid Manufacture from the Chinchona Bark supplied during the Year 1872-73.

DESCRIPTION OF CHARGES.	Cost.
In the Year 1872-73 :	Rs. a. p.
Pay of Superintendent and Coolies - - - -	1,744 8 -
Extra labour - - - - -	62 15 6
Contingent expenses - - - - -	102 11 6
Fuel - - - - -	82 - -
Lime - - - - -	72 8 -
Carriage of alcohol and lime - - - - -	33 10 9
Cost of alcohol used - - - - -	90 - -
Cost of acid sent out by India Office - - - -	407 - -
Cost of soda - - - - -	19 13 10
Subsequent Expenses :	
Cost of collecting fuel - - - - -	37 3 -
Labour - - - - -	56 8 6
Soda - - - - -	9 13 6
Alcohol - - - - -	84 - 8
Acid - - - - -	6 5 -
Oil - - - - -	11 9 4
Cost of powdering the alkaloid - - - - -	3 - -
TOTAL - - Rs.	2,823 11 9

	Bark sent green as analysed.	Per Cent. Dry.	Weight of Dry Bark.	Per Cent. of Alkaloid.	Weight of Alkaloid.
1 April to 20 May 1872 :					
Neddivuttum, trunk - - - - -	943	30	282	4.1	15.5
Ditto - prunings - - - - -	10	—	—	—	—
20 May to 18 June :					
Neddivuttum, trunk - - - - -	2,118	28	612	7.1	43.4
18 June to 3 July :					
Neddivuttum, trunk - - - - -	3,140	29	910	—	38.2
3 July to 18 July :					
Neddivuttum, trunk - - - - -	2,184	29	633	5.1	32.2
18 July to 7 October :					
Neddivuttum, trunk* - - - - -	7,767	30	2,330	4.8	111.8
7 October to 16 October :					
Neddivuttum, trunk - - - - -	7,357	26.8	1,971	4.3	84.7
Ditto - prunings - - - - -	814	25	203	1.7	3.4
16 October to 24 October :					
Neddivuttum, trunk - - - - -	2,679	25.8	691	3.5	24.1
Ditto - prunings - - - - -	533	25	133	2.6	3.4
24 October to 4 November :					
Neddivuttum, trunk - - - - -	3,860	27.7	1,071	4.3	46.0
Ditto - prunings - - - - -	4,749	24	1,139	2.6	29.6
Pykara, trunk - - - - -	958	27	258	5.0	12.9
Ditto, prunings - - - - -	1,480	25	370	1.6	5.9
4 November to 21 November :					
2 Neddivuttum, trunk - - - - -	24	28	6	5.0	0.3
Pykara, trunk - - - - -	750	27	202	5.2	10.5
Ditto, prunings - - - - -	1,486	25	317	1.5	5.5
21 November to 13 December :					
Neddivuttum, trunk - - - - -	22	27	6	4.0	0.2
Ditto - prunings - - - - -	66	25	16	2.2	3.5
Pykara, trunk - - - - -	1,419	27	383	4.0	15.3
Ditto, prunings - - - - -	4,875	25	1,219	1.1	13.4
13 December to 9 January 1873 :					
Neddivuttum, prunings - - - - -	1,251	25	312	1.8	5.6
Pykara, prunings - - - - -	7,100	24	1,700	0.5	8.5
9 January to 10 January 1873 :					
Neddivuttum, prunings - - - - -	135	25	148	0.7	1.0
Pykara, prunings - - - - -	450				
10 January to 27 January :					
Neddivuttum, prunings - - - - -	1,671	24	1,636	0.5	8.1
Pykara, prunings - - - - -	5,147				
27 January to 24 February :					
Neddivuttum, prunings - - - - -	† 7,603	25	1,900	0.6	11.4
Pykara, prunings - - - - -					
24 February to 3 March :					
Pykara, prunings - - - - -	1,890	25	472	0.5	2.3
3 March to 18 March :					
Neddivuttum, prunings - - - - -	1,147	} Not worked.	—	—	—
Pykara, prunings - - - - -	2,520				
Prunings of <i>C. calisaya</i> - - - - -	450	27	121	1.0	1.2
Ditto of <i>C. officinalis</i> - - - - -	3,613	Nearly worthless.		—	—
TOTAL - - -	80,281	—	19,041	79.5	537.9

* 600 lbs. from decayed trees.

† 3,613 lbs. of prunings of *C. officinalis* have here been deducted.

Enclosure 2, in No. 40.

From the Government Quinologist, Ootacamund, to the Acting Secretary to Government, Revenue Department, Fort St. George, dated 14th March 1874.

I HAVE the honour, as directed in G. O., No. 286, of 2nd March 1874, to submit a statement of the total expenditure connected with the alkaloid manufactory, the quantity of bark consumed, and the outturn of "amorphous quinine," since the year 1869.

2. In a report of December last, I had the honour to detail the full cost connected with the manufactory during the year 1872-73, and extending to the time that the manufacture of the bark supplied during that year was completed. I also, in that report, entered fully into the various reasons which induced me to adopt the form of febrifuge I have since prepared, and the various hindrances and advantages connected with manufacture in India. Of the hindrances, the most important is a purely artificial one, which is due to the Commissioner of the Nilgiris and the Superintendent of the Plantations, and not to the merits of its cause; I allude to the "mossing process," which has limited the supply of good bark to the manufactory to but four months of the year. As the objections to this method of cropping will shortly speak for themselves, I need not further discuss them.

3. The figures I have now the honour to submit are therefore those more connected with a time when the manufacture was mainly experimental. This is specially the case with the details of the Ootacamund manufactory. They should not therefore be taken as those of a constant and current manufacture. The adaptation of a manufacture of a new substance to meet a special want to the conditions of an Asiatic country necessarily renders tentative work unavoidable. A constant and regular supply of bark to the manufacture, such as might be easily rendered, would yet diminish the current cost of "amorphous quinine" to a lower figure than I have hitherto been able to reduce it. For a fuller discussion of the conditions of working and value of bark, &c., I must, however, refer to my report of December last. The bark has been almost exclusively that of *C. succirubra*, much of which has been prunings of but small value, the weights are those of the green bark. The market value of a substance like "amorphous quinine," which is in a form quite unused in European medicine, must depend on its intrinsic value. From the Report of the Medical Inspector General it appears to have perhaps the same febrifuge effect as quinine sulphate.

4. I fully coincide in the views stated by Mr. Howard in his letter accompanying G. O., No. 286, of 2nd March, with respect to the advisability of by degrees substituting chinchonidine sulphate for the quinine sulphate. This will have the ultimate effect of raising the value of *C. succirubra* bark, which otherwise will, from its large production, fall very low. I have stated this fully in my report of December 1873. From information I have gathered from medical officers in this country, I am convinced that there is no risk of efficiency, but in some respects positive gain, in the cautious substitution recommended by that gentleman.

5. Mr. Howard also recommends that the *C. succirubra* cultivation should partially be changed for that of *C. calisaya*. I had the honour to recommend the same in my report of August 1873, attached to G. O., No. 208, of 15th December 1873, and remain entirely of the same opinion I then expressed. As the matter has been referred to the Commissioner of the Nilgiris for the opinion of the Superintendent of the Plantations, I am glad to have my recommendation corroborated by that of Mr. Howard.

6. The details I now submit are rendered briefer by the circumstance that I am preparing to leave India on the six months' leave granted in G. O., No. 102, of 23rd January, and have already commenced my preparatory leave from the 4th instant. The details, however, appear to contain all those requested by Government, and a full discussion of the question was submitted in December last.

STATEMENT showing Expenditure incurred on the Alkaloid Manufactory during the Official Years 1869-1873, inclusive.

Description of Charges.	Cost.	Total.
AT OOTACAMUND, 1869, 1870, 1871 :	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>
Buildings - - - - -	7,309 4 6	
Apparatus - - - - -	750 12 11	
Water Supply - - - - -	400 - -	
Alteration of Press - - - - -	160 - -	
Alcohol - - - - -	174 12 11	
Soda - - - - -	20 - -	
Acid - - - - -	47 - -	
Fuel - - - - -	304 13 1	
Sanctioned Establishment - - - - -	2,108 5 7	
Contingent Expenditure - - - - -	459 3 2	
		11,735 - 2
AT NEDDIVUTTUM, 1871, 1872, 1873 :		
Adapting Convict Jail for a Manufactory - - - - -	1,626 11 -	
Erecting Cone-sheds - - - - -	4,600 - -	
Apparatus - - - - -	2,441 11 3	
Ditto, carriage of - - - - -	184 2 3	
Alcohol - - - - -	689 6 5	
Ditto, carriage of - - - - -	88 4 5	
Weighing Machine - - - - -	80 - -	
Bark-presses - - - - -	1,075 - -	
Acid - - - - -	514 1 -	
Soda - - - - -	162 13 4	
Quicklime - - - - -	100 - -	
Cart-hire - - - - -	406 12 3	
Vats - - - - -	54 - -	
Sanctioned Establishment - - - - -	2,792 2 11	
Extra Labour - - - - -	134 3 2	
Contingent Expenditure - - - - -	497 0 6	
Arbuthnot & Co., for landing charges, &c. - - - - -	25 1 -	
		15,471 5 6
Total - - - Rs.		27,206 5 8

BARK SUPPLY AND OUTTURN.

		<i>Lbs.</i>
OOTACAMUND MANUFACTORY -	1869-70 :	
	Bark supplied - - - - -	17,793
	Out-turn :	
	Amorphous quinine - - - - -	21½
	1870-71 :	
	Bark supplied - - - - -	51,352
	Out-turn :	
	Amorphous uinine - - - - -	127'
NEDIVUTTUM MANUFACTORY -	1871-72 :	
	Bark supplied—	
	Trunk - - - - -	22,243
	Prunings - - - - -	12,829
	Out-turn :	35,072
	Amorphous quinine - - - - -	- - 100
	1872-73 :	
	Bark supplied—	
	Trunk - - - - -	33,841
	Prunings - - - - -	46,440
	Out-turn :	80,281
	Amorphous quinine - - - - -	- - 215
	Amorphous quinine from the same bark - - - - -	- - 130½

Enclosure 3, in No. 40.

From the Surgeon General of Hospitals, Indian Medical Department, Fort St. George, to the Acting Secretary to Government, Revenue Department; dated Fort St. George, 28th April 1874.

WITH reference to paragraph 2 of Government Order, No. 286, of 2nd March 1874, I have the honour to submit, for the consideration of the Right Honourable the Governor in Council, the following remarks on the points raised by Her Majesty's Secretary of State for India, with regard to the use of quinine, chinchonidine, quinidine, chinchonine, and of amorphous quinine in this presidency.

2. In paragraph 7 of this Despatch, the Secretary of State expresses surprise that the valuable reports of the Chinchona Commission of this presidency should have borne so little fruit in the way of encouraging medical men to use the other alkaloids in lieu of quinine; and, with reference to this, I beg to explain that in the year 1868, immediately after the Chinchona Commission's report established the therapeutical value of the sulphates of chinchonidine and quinidine, the price charged for each of these articles was no less than 4*l.* per pound at a time when quinine was being purchased at 3*l.* 4*s.* per pound. On my predecessor becoming aware of this, he omitted chinchonidine and quinidine altogether from his next annual indent, and observed that "quinine has been indented for in consequence of the Examiner of Medical Accounts having intimated that, according to the price-list received by him, it is cheaper than any of the new alkaloids

except chinchonine." The omission of these alkaloids from the 1869 indent, of course, reduced the established proportion, which, in turn, diminished the issues in succeeding years, and thus the demands for these articles have fallen off. But, whilst the high price of the alkaloids prevented their being indented for, it is proper to say that the profession generally have not acquired the same confidence in chinchonidine, quinidine, and chinchonine that they have in quinine, and this feeling has also contributed to decrease the demands for the articles in the home indents. Like all other new remedies, it will take time to establish their reputation, more especially as they have to take the place of the well-known quinine. Medical men may have a certain amount of confidence in their therapeutical value, and yet hesitate, in critical cases, to use them in preference to quinine, in which they have, from prolonged experience, the fullest reliance. A few officers, indeed, have little or no faith in the febrifuge properties of quinidine, chinchonidine, and chinchonine, and object to use them under any circumstances, though the results of the trials carried out under the auspices of the Chinchona Commission, and subsequent experience, leave no doubt that these preparations will, in course of time, occupy a much higher place in the list of febrifuges than has hitherto been accorded to them by the profession generally. The remedies must, however, be allowed to work their way on their own merits into professional favour.

3. I consider the suggestion of Mr. Howard to encourage the use of chinchonidine a most valuable one, and if, as he believes, it could ultimately be sold in Indian bazaars at one rupee per ounce, the boon to the fever-scourged people of this presidency would be simply inestimable. The total deaths from all causes registered in the Madras Presidency during 1872 were 508,182, and of these no less than 214,148 are attributed to fever. From this death-roll can be estimated the amount of fever cases not fatal, and of other diseases which fevers have called into existence, and from which the sufferers ultimately die. There is no popular want so pressing at the present moment as that of a cheap chinchona febrifuge, as I firmly believe that a vast amount of sickness and suffering, of which nothing is heard, and 50 per cent. at least of the deaths which now take place from fever, would be prevented by such an agent. I am further of opinion that chinchonidine would fully meet this want, if supplied in sufficient quantity and at a low price, say one rupee per ounce. At this rate, a poor man could for one anna obtain 27 grains of the drug, which, in ordinary cases, would probably be sufficient to cure an attack of fever. Considering, however, the very scant means and even poverty of a large body of the people, even one rupee the ounce is a high price if this drug is to become a febrifuge within the reach of the masses; and it is proper to mention here that I entertain grave doubts as to chinchonidine ever being supplied at that rate even in Great Britain, putting aside freight and other charges which would be incurred before it reached Madras. But few barks would probably yield more than 4 per cent. of the alkaloid, if so much, so that it would require more than 1½ lbs. of bark to get one ounce of alkaloid. Assuming, then, that such rich bark could be purchased at 18 pence per pound, it will be seen that the cost of the bark alone would exceed the price at which it is proposed to sell the alkaloid.

4. With regard to the therapeutical value of chinchonidine, I need only quote the opinion of the Chinchona Commission, who say that "ordinary sulphate of quinine and sulphate of quinidine possess equal febrifuge power," and that "sulphate of chinchonidine is only slightly less efficacious." If, therefore, Mr. Howard's anticipation as to the price of chinchonidine could only be realised, there would be no doubt about the propriety of making it the febrifuge of the future for the people of India. I must not

omit

Price of Chinchona Alkaloids, as
given by Examiner of Medical
Accounts.

Sulphate of quinine	-	Rs. 32
" quinidine	-	40
" chinchonidine	-	40
" chinchonine	-	12

omit to notice one advantage that it possesses, viz., its great resemblance to quinine, both in appearance and taste. The latter drug has now become quite familiar to the great bulk of the people, and it is of no little importance that the new article should resemble it in all points as nearly as possible. In fact, a great many would look on chinchonidine sulphate as an old friend with a new name.

5. In the 6th paragraph of his Despatch, the Secretary of State notices that latterly the indents for quinine and other chinchona alkaloids from Madras have been smaller than the demands from Bombay, although the latter is the lesser presidency, and wishes to know whether the reduction in demand is due to the use of Mr. Broughton's local manufacture. In answer to this inquiry, I have the honour to mention that the issues of the Nilgiri preparation from 1870, the year of its introduction, to March 1874 inclusive, have been as per margin, and there can be no doubt that 1870 Issues - - - 8 6½ they have reduced the consumption of the European preparations to an 1871 ditto - - - 89 10 extent commensurate with the total quantities used of the local manufacture. 1872 ditto - - - 85 10 It will be observed that the issues during 1873 were considerably less than 1873 ditto - - - 30 2 the two preceding years. This was chiefly due to the available stock of 1874 ditto - - - 10 12 the "amorphous quinine" having been reduced by the transmission in the course of the year of 160 lbs. in two instalments to Calcutta, and 50 lbs. to Bombay. The first supply to Calcutta was forwarded in February 1873, to meet a demand for chinchona alkaloids during the outbreak of Burdwan fever; and as a subsequent demand was made in September 1873 for another supply of the local preparation, it is legitimate to infer that the drug had been found efficacious in the treatment of the severe type of fever which was then ravaging that part of Bengal, and a further supply of 80 lbs. has since been sent to Calcutta in January 1874.

6. In paragraph 5 I have given a statement of the annual supplies of the Nilgiri "amorphous quinine," furnished to the Medical Department, and it now only remains to notice, in compliance with the request in paragraph 5 of the Secretary of State's Despatch, "the quantity that has been sold to the public, with the price, and the judgment that has been formed with reference to its efficacy;" I therefore place in the margin a statement showing the issues that have been made to hospitals and to civil authorities, for sale and gratuitous distribution, during each year since its first introduction. From the statement given in this and the preceding paragraph it will be gathered that the total supplies of the Nilgiri preparation sent to the Medical Store Depot, Madras, have been disposed of as follows:—

	Lbs.	oz.		Lbs.	oz.
To Calcutta - - - - -	240	0	1870:		
„ Bombay - - - - -	50	0	To Military hospitals - - - -	0	0½
„ Military Hospitals in this presidency - - -	33	8½	„ Civil hospitals - - - - -	8	6
„ Civil „ - - - - -	58	8	1871:		
„ Collectors for sale and gratuitous distribution in this presidency.	132	8	„ Military hospitals - - - -	20	10
TOTAL - - -	514	8½	„ Civil hospitals - - - - -	21	0
			„ Collectors for sale and gratuitous distribution - - - - -	48	0
			1872:		
			„ Military hospitals - - - -	6	0
			„ Civil hospitals - - - - -	8	10
			„ Collectors for sale and gratuitous distribution - - - - -	71	0
			1873:		
			„ Military hospitals - - - -	6	12
			„ Civil hospitals - - - - -	13	14
			„ Collectors for sale and gratuitous distribution - - - - -	9	8
			1874 (three months):		
			„ Military hospitals - - - -	0	2
			„ Civil hospitals - - - - -	6	10
			„ Collectors for sale and gratuitous distribution - - - - -	4	0
			TOTAL - - -	224	8½

The greater portion of the issues in this presidency has been to collectors for sale and gratuitous distribution, and steps will now be taken to ascertain the respective quantities which have been sold and distributed gratis. It will be observed that the supplies sent to Calcutta for use in the Burdwan district exceed the total consumption in this presidency. The rate at which amorphous quinine is sold to the public is Rs. 1.8 per ounce, that price having been fixed in Government Order, No. 710, of 20th April 1871, in communication with Mr. Broughton. In paragraph 38 of this officer's report in Government Order, No. 408, of 1st April 1874, it is stated that the expense of making each ounce of the amorphous preparation is now only 8 a. 2 p.; and as there is used in the manufacture a good deal of bark which in Europe would be commercially worthless, this should be considered when calculating the cost, and the selling price might now be reduced at least to half-rupee the ounce, which will probably be found a remunerative rate, and thus the benevolent intentions of Government, with regard to supplying a cheap febrifuge for the country at large, would be in a measure met.

7. It now remains to notice the judgment that has been formed by the Medical Department with reference to the efficacy of the amorphous preparation as a febrifuge. With a view of submitting it to a rigorous test, small quantities of the drug have been, from time to time, supplied to civil and military hospitals, some of which are situated in notoriously malarious districts. At the same time, blank forms, similar to those used by the Chinchona Commission, were issued for the tabulation of results, so that the qualities of the febrifuge might be subjected to the logic of figures. I append a table showing the results of the whole of these trials. Altogether 1,882 cases were treated with the drug, and of this number 1,711 were of the quotidian, 128 of the tertian, 34 of the quartan, and nine of

the remittent type. There was thus in the variety of type ample scope for a searching test of the febrifuge powers of the new preparation, while, on the other hand, the fever met with in some of the districts in which the experiments were conducted is of a most obstinate character, and very frequently accompanied with dangerous complications. To these latter peculiarities in the nature of the fever at Lackady in Wynaad are to be attributed partly the great length of time the patients were under treatment and the large consumption of the febrifuge. On the whole, the results are favourable, and, but for the Lackady figures, they might have been pronounced very satisfactory. Out of the 1,882 cases that came under treatment, it will be observed that in only four instances did the drug fail to effect a cure. In one case the final result was not known, as the patient did not return after the first dose. The average time that each patient was under treatment was 13.2 days, and the average quantity of the drug administered from first to last in each case 162.3 grains. These high averages are chiefly due to the Lackady figures. As already stated, fevers contracted in that neighbourhood are very obstinate, and often complicated with other affections; and it is, therefore, quite possible that the hospital assistants who conducted the experiments may have allowed cases to remain under the heading of "Fever" not only till the paroxysms were checked, but also till the complications of the disease were finally cured. Indeed, there seems no other method of accounting for the very exceptional results recorded at this place. At Goodalore, another Wynaad station, the type of fever may be said to be identical with that prevailing at Lackady, and yet the results were very different. Putting the Lackady figures aside, the remaining results show that, under the use of amorphous quinine, a cure is effected in a period nearly the same as that required by chinchonidine, quinidine, or quinine, but with a somewhat larger expenditure of the drug. In submitting the returns of results of treatment, medical officers commented (in some instances most favourably, in others less so), on the properties of this new febrifuge; but I have not deemed it necessary to transcribe these, as the tabular statement contains the pith of the whole, and will place before Government the facts from which I have formed my opinion. In conclusion, I beg to state briefly that "amorphous quinine" is a sure febrifuge but little inferior to the European chinchona alkaloids, and that if it can be sold at one rupee per ounce, or a cheaper rate, it is extremely desirable that it should be manufactured in larger quantities.

TABLE showing the Results of Treatment of Malarious Fever by the Amorphous Alkaloids prepared from Indian-grown Barks.

STATION.	Name of Medical Officer.	TYPE.					Average Time under Treatment.	Average Quantity of Drug used.	RESULT.		REMARKS.
		Total Cases treated.	Quotidian.	Tertian.	Quartan.	Remittent.			Cured.	Doubtful.	
Lackady (Wynaad)	Hospital Assistant :						Days.	Grains.			
	T. Israel - - - -	566	480	57	29	-	73	1030.7	566	-	
	C. T. Venkatroyooloo - -										
	A. Parthasarathy Pillay - -										
T. R. Dorasawmy Pillay - -											
Goodalore (ditto)	Assistant Apothecary Wade - -	80	68	5	5	2	2.1	24	78	*2	* Patient did not return after first dose.
Upper Godavery Barrier Works.	Assistant Surgeon Hazlett - -	92	87	2	-	3	7.4	91.8	89	3	
	Ditto A. E. Dalgairns - -										
Raneepett	Dr. Scudder - - - -	55	51	-	-	4	8.7	52	55	-	
11th Regiment N.I., Raepore	Assistant Surgeon C. A. Harvey	180	167	13	-	-	4.7	49.4	180	-	
South Arcot District :											
Kullacoorchy Taluq	Syed Alli Mahomed - - -	268	232	36	-	-	4.3	19	268	-	One died.
Chengum and Trikaloor Taluqs	T. L. Thavasagayum Pillay - -	526	520	6	-	-	2	4.7	526	-	
Trinomalay Taluq	Syed Alli Mahomed - - -	115	106	9	-	-	3.3	27.4	115	-	
TOTAL		1,882	1,711	128	34	9	13.2	162.3	1,877	5	

Fort St. George, 28th April 1874.

Enclosure 4, in No. 40.

From the Commissioner of the Nilgiris, to the Acting Secretary to Government, Revenue Department, Fort St. George; dated Ootacamund, 14th March 1874.

WITH reference to the Government Order, Revenue Department, 15th December 1873, No. 1,428, directing me to obtain any observations the Superintendent of the Chinchona Plantations may have to offer on a report of the Government Quinologist upon the changes produced by age and growth in the chinchona-trees in the Government plantations on the Nilgiri Hills, and at the same time to submit my own remarks, I have the honour to forward a letter from Mr. McIvor on the subject.

2. Mr. McIvor has for a long time held the opinion put forward by Mr. Broughton that after a certain age the cellular tissue in bark which contains the alkaloids gives way to liber fibre, and that the further this metamorphosis extends the greater is the deterioration in the bark. A complete substitution of liber fibre for cellular tissue is, in fact, a conversion of bark into a material worthless to the quinine manufacturer. Mr. McIvor concurring thus completely with the quinologist, accepts further the statement that the bark in our oldest *Succirubra* plants has entered upon the course of decline; and he suggests that the bark of these trees should be harvested. There are 6,000 of them. Mr. McIvor would advocate harvesting also the crown-barks of eleven years old, on the same grounds. There are 18,000 of these trees. The deterioration of bark by age was fully discussed in Mr. McIvor's letter and in mine in Government Order, 5th September 1873, Revenue Department, No. 952, and the identical conclusions now stated detailed. But in that Order the Government were pleased to direct one-fourth of the unmossed trees of 11 and 10 years old should be preserved for coppicing until the mossaing process was demonstrated to be superior. The Government remarked that the immediate loss in bark thus entailed was not of any moment. I see no sound reason for a modification of the Order at present, because circumstances have not changed since it was published, and though I agree with Mr. McIvor, I cannot recommend that the older trees shall be harvested at present in greater proportion than is expressed in the Order.

3. Mr. McIvor next touches upon the question of filling vacancies with *Calisaya*. He states this species is weakly, and remarks upon the fact that a plant of a weak character will not grow amongst more vigorous plants which overshadow and choke it.

4. The next point touched by Mr. McIvor is the sale of Java bark noticed by Mr. Broughton. This bark did not fetch such good prices in Amsterdam as the bark sent home from the Nilgiris last year realised in the London market. It may be objected that the circumstances of the two sales may have been different, and the higher price obtained for the Nilgiri bark not be a perfect test of its superiority. The fact, however, is that, if anything, better prices are habitually obtained for bark at Amsterdam than in London. Purchasers in London must be discriminating purchasers, because bark is invariably sold on analysis. There is no guesswork in the matter. The Government will have noticed with pleasure that even the worst barks of the 23,000 lbs. sent home last year fetched a good price. Certain crown-barks, not worth working up in Mr. Broughton's factory, realised from 2 s. to 3 s. 6 d. a-pound. Mr. Broughton anticipated this bark might sell fairly, though he was adverse to its shipment, as he stated in his letter in Government Order, 8th September 1873, No. 955, Revenue Department. The sales enumerated do not tend to establish a need for particular attention being bestowed on the *Calisaya*.

5. With regard to the views expressed by Mr. Howard upon the red barks, I quoted them in a letter, dated 7th January 1874, No. 3, I addressed Government on that subject exclusively.

6. I shall forward the samples of barks required by the 2nd paragraph of the Order under reply so soon as I receive them from Mr. Broughton.

From the Superintendent of the Government Chinchona Plantations, to the Commissioner of the Nilgiris; dated Ootacamund, 14th February 1874.

I HAVE the honour to acknowledge the receipt of Government Order, dated 15th December 1873, No. 1,428, with your endorsement of the 19th, calling for any observations I may wish to offer in connection with the subjects discussed in the papers recorded in the above proceedings.

2. The report submitted by Mr. Broughton details certain changes "produced by age and growth" in the bark of several species of chinchona, and as that gentleman's observations appear to establish and confirm the well-known and generally accepted conclusions

arrived at years ago, this part requires no remark further than bringing prominently to notice the very important fact that the "bark on our oldest trees of *C. Succirubra* has passed its age of maximum yield of alkaloid;" and I submit, therefore, that this bark should be harvested as early as possible in order to prevent further deterioration.

3. I observe that, at paragraph 14 of his report, Mr. Broughton recommends the extension of our *Calisaya* cultivation by filling up all failures which occur among the trees of *C. Succirubra* with plants of *C. Calisaya*. In my opinion there are several reasons which would render any attempt to carry out this system unprofitable and unsuccessful. In the first place, *C. Calisaya* is a species which has hitherto, in all the varieties yet imported and grown on the Nilgiris, given unmistakable indications of being unsuited to our climate. The plant is weak and of delicate growth. It is extremely liable to disease, and for these reasons I believe it to be the most unprofitable species to cultivate on the Nilgiris. Moreover, its weak habit of growth renders it quite unsuited to fill up failures among a strong-growing and vigorous species such as *C. Succirubra*. Its delicate constitution is another serious drawback to using the species at all for filling up vacancies, it being well known to all practical planters that successfully to establish plants in vacancies requires a more vigorous plant than that originally planted. The reason of this is plain: the established plants in the neighbourhood grow faster than *C. Calisaya*, spreading their roots and branches farther, and thus robs the weaker plant of nourishment and moisture while the branches overshadow it. This even takes place when strong-growing and less vigorous species are planted out at the same time together, to such an extent that the stronger-growing invariably destroys the weaker. For the above reasons, the experienced planters would carefully avoid the selection of a slow-growing and delicate species to fill up vacancies among a strong-growing and vigorous variety.

4. In Mr. Broughton's covering letter, that gentleman further urges the adoption of this system by bringing prominently forward the fact that "certain specimens of *C. Calisaya* have sold in Amsterdam for the extraordinary prices of 8 s. to 9 s. 5 d. per kilogramme, or 3 s. 7½ d. and 4 s. 3½ d. per lb.," and concludes by giving an analysis of certain Java *calisaya* bark as yielding 7.65 per cent. of total alkaloids and 6.91 of quinine, remarking: "This bark, therefore, is of better quality than any grown on our plantations, with the exception of var. *Angustifolia*." I annex to this letter the invoice and analysis in detail of these Java barks sold in Amsterdam. It will be noticed that, although four cases containing 261 kilogrammes brought the high figures quoted, the average prices realised were low.

5. I think it proper to place in juxtaposition to this list of prices obtained for Java barks the list of prices obtained for the 23,000 lbs. of bark sent home from the Nilgiri plantations last year. Our *C. Officinalis* stem-bark fetched from 4 s. 6 d. to 5 s. 9 d. per lb., and the general prices obtained were much higher than those brought by the Java barks. The price of the *C. Officinalis* would indicate, contrary to Mr. Broughton's impression, that this is better than the Java *calisaya* bark.

6. At paragraph 14 Mr. Broughton states: "It appears to me to have been unfortunate that chinchona cultivation should have been so greatly occupied with *C. Succirubra* at its commencement." This opinion is apparently founded on the statement given at paragraph 7, that "*Succirubra* appears the worst species for producing bark for export." Upon this point I beg to draw your attention to a private letter I received from Mr. Howard some time ago, and the statements in which I believe you communicated to Government. The *succirubra* bark in our consignment above mentioned brought us high as 3 s. ½ d. per lb.

7. At paragraph 20 Mr. Broughton brings to notice that the beneficial effects of mossing become less evident with the increased age of the tree. If this means that renewed bark on the oldest trees we possess is not so rich as renewed bark on young trees, I am not prepared to follow Mr. Broughton. My experience is that renewed bark two years old is at the best state for cropping as regards the quantity of contained alkaloids, and that this bark, speaking without formal precision, is as valuable on old as on young trees.

8. I never for a moment contemplated bark as old as the tree on which it is grown continuing to improve. I have all along acted on the knowledge that beyond a certain age, cellular tissue, which Mr. Broughton justly states contains the alkaloids, gives way to liber fibre, which the older it is the less alkaloid it must yield.

DUTCH TRADING COMPANY.

DESCRIPTION of the Parcels of Java Barks of Crop 1872, sold by Public Auction on the 27th May 1873.

CLASS.	Chests.	Kilo.	Prices Realised per 12 Kilo.	Percentage of Alkaloid variable.	Quinine variable.
Calisaya A - - - -	72	4,666	113 c	—	—
Ditto B - - - -	23	1,525	194 c	Variable - -	Variable.
Ditto C - - - -	3	140	116 c	Ditto - -	Ditto.
Ditto D - - - -	5	346	158 c	5 per cent. -	Uncertain.
Ditto E - - - -	4	261	457 c	7 per cent. -	$\frac{3}{4}$
Haskarlana - - - -	20	1,358	141 c	4 to 5 per cent. -	$\frac{1}{3}$ to $\frac{1}{2}$
Succirubra - - - -	5	362	115 c	—	—
Officinalis - - - -	8	407	201 c	4 per cent. -	$\frac{1}{2}$
Caloptera - - - -	1	62	173 c	4 to 5 per cent. -	—
Pahudiana - - - -	35	2,193	128 c	1 to 4 per cent. -	—
Powder - - - -	29	3,519	16 c	—	—
Ditto - - - -	3	—	13 c	—	—

Ootacamund, 14 February 1874.

CHINCHONA BARK from the Government Plantations on the Nilgiris, sold by Public Auction in London on the 11th November 1873.

Class.	Cases.	Lbs.	Price.	Class.	Cases.	Lbs.	Price.
			s. d.				s. d.
Crown bark - -	2	343	5 9	Red bark - -	2	314 $\frac{1}{2}$	2 11
Ditto - -	27	6,670	4 7	Ditto - -	6	1,038	2 10
Ditto - -	2	297	4 6	Ditto - -	9	1,756 $\frac{1}{2}$	2 7
Ditto - -	1	210	4 5	Ditto - -	1	238	2 6
Ditto - -	3	368 $\frac{1}{2}$	4 -	Ditto - -	1	182	2 5
Ditto - -	2	396 $\frac{1}{2}$	3 10	Ditto - -	2	394	2 4
Ditto - -	5	743 $\frac{1}{2}$	3 8	Ditto - -	4	1,136	2 3
Ditto - -	1	173 $\frac{1}{2}$	3 6	Ditto - -	1	524 $\frac{1}{2}$	2 1
Ditto - -	2	302 $\frac{1}{2}$	3 5	Ditto - -	1	161 $\frac{1}{2}$	2 -
Branch bark - -	2	466	3 6	Ditto - -	3	271	1 4
Ditto - -	9	1,341 $\frac{1}{2}$	2 6	Ditto - -	3	470	1 3
Ditto - -	2	308	2 4	Branch bark - -	7	972 $\frac{1}{2}$	2 3
Red bark - -	2	671	3 2	Ditto - -	1	194	2 2
Ditto - -	1	166 $\frac{1}{2}$	3 1	Ditto - -	1	161 $\frac{1}{2}$	2 -
Ditto - -	6	1,625 $\frac{1}{2}$	3 -				

Enclosure 5, in No. 40.

MINUTE by the Hon. J. D. Sim, C.S.I.

FROM the papers submitted it appears that we have now 6,000 trees of *C. Succirubra* which have reached the age when the yield of alkaloids begins to decrease. The fact that after a certain age this result would ensue was, as the Commissioner observes, long since noted by Mr. McIvor; and as the analyses of Mr. Howard and Mr. Broughton confirm the conclusion, so far at least as *C. Succirubra* is concerned, we may safely act on it, and proceed to harvest the bulk of the bark of these 6,000 trees before further deterioration ensues. In the Order of the 5th September 1873, No. 952, Government directed that one-fourth of these trees should be "retained for coppicing," and three-fourths treated according to the mossing system. The intention of Government was, as I understood, that the trees should be *coppiced*, and not merely *retained* for that purpose. I understand that 1,000 of the trees have been mossed. I would now suggest that 1,000 more be thus dealt with, and 2,000 coppiced, the remaining 2,000 being retained for experimental purposes; a small number being annually mossed and coppiced in equal proportions in order to test, over a long series of years, the consequences of age and the effects of each mode of harvesting on this particular species of chinchona.

2. Besides the above 6,000 *succirubra* trees, we have 18,000 crown-barks of 11 years' age, which it is proposed to harvest at once. As regards this species it does not seem to me that deterioration from age, at least so soon, is so clearly established that we need harvest these trees simply and solely to escape that consequence. In his letter to the Secretary of State, dated 16th January 1872, Mr. Howard says he has "no doubt that these barks will improve with age," and again that "there is no fear that these varieties of *C. Officinalis* should deteriorate with age." In another part of his letter Mr. Howard speaks of this deterioration after a certain age as "the peculiar habit of the species *succirubra*." Mr. Broughton cannot yet state the changes taking place in the quality of crown-barks, as they advance in age, with the same precision as in the case of *C. Succirubra*; but as yet the analyses "show that no cessation of the formation of alkaloids, or any deterioration of quality is yet apparent from the increase of the age of the bark." I see no need, therefore, for harvesting these trees solely for the object of avoiding waste of alkaloids, and would leave this to be done as our requirements of bark dictate. I do not see any reason to alter the proportion of trees to be mossed and coppiced, which was prescribed in our Order of the 5th September last, No. 952; but it should be explained that the trees are not to be "retained for coppicing," but that mossing and coppicing should proceed *pari passu* in the proportion fixed.

3. The other question for decision is the extension of *C. Calisaya*. This cannot be done in the manner proposed by Mr. Broughton, but there is nothing to prevent additional land being planted with this variety if Government deem it desirable. My own opinion is adverse to such a measure, because, as Mr. McIvor states, experience has shown that the climate of the Neilgherries is not suited to it, and because in *C. Officinalis* we have a

Note.—As a disadvantage of the *C. Officinalis*, Mr. Broughton mentions that the branches are nearly valueless. Mr. Howard, however, says that "the very youngest shoots that could be peeled have often been sold and even preferred by the trade."

species nearly, if not quite, its equal which succeeds well. Mr. Howard writes in high terms of the crown-barks (*C. Officinalis*), and Mr. Broughton believes "the final success of chinchona cultivation on the Neilgherries will result from the export of these crown-barks."

Under these circumstances we may, I think, rest content with the 55,000 trees we possess of the *calisaya* variety, and rather add to our stock of *C. Officinalis* the varieties especially noted for their excellence by Mr. Howard.

4. One important subject for consideration is what to do with our barks. The *C. Succirubra* is declared on the best authority *not* to be the quinine-producing tree of the family; it yields the other alkaloids in greater proportion. Its bark still fetches a high price in the English market; but Mr. Broughton says, emphatically, "it appears to be the worst species for the production of bark for export," and Mr. Howard especially dwells on the importance of regarding it as a "chinchonidine-producing material." It seems to me, therefore, that our best course is to send home only so much of the *succirubra* bark as may be needed for special purposes, such as analysis, testing of market value, etc., and to reserve the great bulk for conversion on Government account into sulphate of chinchonidine for the use of our native population who cannot afford to buy quinine. I conclude Mr. Broughton will have no difficulty in using up all the bark we have of this one species, and of manufacturing the product as economically as it is manufactured at home; but if he cannot do so the surplus must, of course, be sent home for manufacture there. The crown and other barks, on the other hand, should be chiefly sent home, as their quinine-yielding properties render them especially valuable there. Of course this measure cannot be adopted immediately, but it should be our guiding principle.

5. The paper which accompanies Mr. McIvor's letter to the Commissioner gives the prices which our bark has realised in England in comparison with the prices realised by the Java barks. Mr. Broughton laid especial stress on the high price realised by some

Java

Mr. Broughton's letter to Government, 22 August 1873, pp. 10 and 11.

Letter to Government, dated 22 August 1873, para. 7.

Java calisaya bark; but our own crown-barks fetched even higher prices, and the general average of our bark is, as Mr. McIvor points out, considerably higher than that of the Java bark. It will be observed that some branch crown-bark sent home (Mr. Broughton stated contrary to his advice, and, the Commissioner adds, rejected by him as unfit for the use of the factory at Neddivuttum) realised from 2 s. to 3 s. 6 d. per pound. If this be the case, the result naturally suggests a doubt as to whether there is not some defect in his process of manufacture which fails to extract all the alkaloids in the bark. In this bark which he rejected there must, I should suppose from the price realised, have been some 2 per cent. of quinine. Mr. Broughton has described his method of manufacture very fully in his letter of the 1st December 1873. It is evident, from the prices realised in the English market for bark rejected here, that there must be a great loss between the laboratory and the manufactory results. This is a very important subject, and merits our serious consideration; for on it turns the question whether we should continue to manufacture here, or leave this to be done in England. One object of the manufactory here was to utilise bark which it would not be worth while to send to England. I would suggest that the amorphous quinine which has been issued for experimental use in our hospitals should be submitted to the analysis and valuation of Mr. Howard and Dr. DeVrij.

27th April 1874.

MINUTE by the Hon. W. Robinson, C.S.I.

I AGREE with Mr. Sim on the whole. But unless medical science establishes the efficacy of alkaloids other than quinine, and thus raises the value of *C. Succirubra*, the further use of this species, even for filling vacancies, should be given up entirely; not that the matter of filling vacancies is pressing as regards the plantations at Neddivuttum, for thinning must be the order of the day for long there. On this point, therefore, a decision is needed. One of the other two species, *C. Officinalis* or *C. Calisaya*, must be used.

2. Mr. Sim advocates the former, and I agree with him for the reasons he gives, wherever the *C. Calisaya* does not thrive; wherever it does thrive fairly, the *C. Calisaya* should be preferred.

3. I think that the doubt raised as to the efficiency of the factory should be inquired into and set at rest at once; and I am inclined, on further consideration, to think that Mr. Sim's proposal to have the analysis conducted at home the best plan.

30th April 1874.

MINUTE by His Excellency the Commander-in-Chief.

I FULLY concur with the Hon. J. D. Sim, especially as regards the method by which he would test the value of Mr. Broughton's operations at Neddivuttum. We have no knowledge of Dr. Bidie's qualifications as a chemist, whereas in a matter of such vast importance we should take care to obtain the opinion of the most eminent available. We could hardly ascribe much value to that of any other.

2. We should not be in too great a hurry to condemn *C. Succirubra*; for I observe that whilst Mr. Howard speaks most disparagingly of that bark from coppice, he speaks highly of the bark renewed under the mossing process (*vide* "Gardeners' Chronicle," March 28th, 1874, page 408).

23rd May 1874.

MINUTE by His Excellency the Governor.

I THINK that sufficient reason is shown for the action which is proposed by the Hon. Mr. Sim respecting the *C. Succirubra* trees. As regards the choice between *C. Officinalis* and *C. Calisaya*, Mr. McIvor says that the latter will not grow well on the Nilgiris, and this seems to be sufficient reason for preferring the former. I think that the subject noticed by Mr. Sim in the last paragraph of his Minute, respecting the process of manufacture in the factory and the real value of its results, is one requiring serious consideration; and I would select, as suggested by the Hon. Mr. Robinson, some person or persons to inquire into and report upon it, with a view to a satisfactory solution of the question whether our manufacture should be continued.

6th June 1874.

ORDER of the Madras Government thereon, 22nd June 1874, No. 759.

IN August last Mr. Broughton forwarded an account of the results obtained by him in the analysis of specimens of different species of chinchona, "in order to trace the changes produced by age and growth of the several kinds."

This report was sent to Mr. McIvor for his remarks, which have now been received.

2. Mr. Broughton first pointed out that the analysis of bark from the oldest trees of *C. Succirubra* show that this bark "has passed its age of maximum yield of alkaloids," and

"appears to be even deteriorating in total yield of alkaloids." This is in accordance with the known "peculiar habit of the species," to use the words of Mr. Howard, who in 1872 remarked that "the bark does not really improve by age, but the contrary."

3. Mr. McIvor, who predicted the probability of this result in his report for 1864-65, concurs, and proposes to harvest the whole of the older trees, whose number, the Commissioner states, is 6,000.

4. Mr. McIvor would appear to contest Mr. Broughton's low estimate of the value of *C. Succirubra* for export purposes, probably on the ground that *succirubra* is still worth exporting, as it fetches 3 s. 6 d. per lb. (not that it is better than *calisaya* and *officinalis*). Mr. Howard, however, has already remarked that "it cannot be looked upon as the quinine-tree of the future;" and on Mr. McIvor's own showing, the *highest* price obtained at the recent sales of *stem* bark of this species was less than the *lowest* obtained for *stem* bark of *C. Officinalis*.

5. From *C. Succirubra* Mr. Broughton turns to *C. Officinalis*, but none of his remarks on this species are noticed by Mr. McIvor.

The Commissioner, indeed, states that Mr. McIvor would harvest the older barks of this species also, on the ground apparently that they will deteriorate; but Mr. Broughton notices no deterioration, nor any cessation of the formation of alkaloids, and Mr. Howard has stated of the good varieties of this species that "there is no fear" of the bark deteriorating with age.

6. As to the species of *C. Calisaya*, Mr. Broughton remarks that its bark, "notwithstanding its youth, is fully equal to good South American *calisaya* in yield of quinine." He anticipates much success from the export of this species when of fit age, and points out that the Netherlands Government are cultivating it largely, that it has the greatest reputation of any of the *chinchona* in the European market, and that its branch-bark is better than that of *C. Officinalis*. On these grounds he would recommend casualties among the *C. Succirubra* being replaced by plants of *C. Calisaya*.

7. Mr. McIvor contests this recommendation, on the following grounds:—1st, that the plant is, on the Nilgiris, a delicate one, and therefore will not grow well among the more robust *succirubra*; and, 2ndly, that, as tested by recent sales, *C. Officinalis*, which grows well here, brings higher prices.

8. In regard to *C. Succirubra*, it is plainly shown that the 6,000 trees referred to have reached the age when the yield of alkaloids begins to decrease, and the bulk of the bark should, therefore, be harvested. The Government understand that 1,000 of these trees have already been mossed. A similar number should be treated in the same way, and 2,000* should be *coppiced*, that is, cut down and allowed to come up again, the remaining 2,000 being retained for experimental purposes. This so far modifies the Order, dated 5th September 1873, No. 952, which contemplated the harvesting of all these trees.

*Note.—This number will form one-third of those to be coppiced under Government Order, 11 April 1874, No. 434, para. 4.

9. Of the 2,000 trees reserved by the preceding paragraph, a small number should be annually mossed and coppiced in equal proportions, in order to test, over a long series of years, the consequences of age, and the effects of each method of harvesting on this particular species of *chinchona*.

10. In regard to the 18,000 crown-barks (*C. Officinalis*), it does not appear that deterioration from age need be alleged as a reason for harvesting these trees. On the contrary, in his letter to the Secretary of State, dated 16th January 1872, Mr. Howard states that he has "no doubt that these barks will improve with age," and again that "there is no fear that these varieties of *C. Officinalis* should deteriorate with age."

Mr. Broughton cannot (*vide* paragraphs 10 and 11 of his letter, dated 22nd August 1873) yet state the changes taking place in the quality of crown-barks as they advance in age with the same precision as in the case of *C. Succirubra*; but, so far, "the analyses show that no cessation of the formation of alkaloids or any deterioration of quality is yet apparent from the increase of the age of the bark." These trees need not, therefore, be harvested solely with the object of avoiding waste of alkaloids, but may be dealt with as the requirements for bark dictate; the instructions in Government Order, 5th September 1873, No. 952, being observed as to the proportions to be mossed and coppiced. It should be understood that the expression in that order "retained for coppicing" is meant to imply that mossing and coppicing should proceed *pari passu* in the proportion fixed.

11. With reference to the opinion expressed by Mr. McIvor about *C. Calisaya*, it is not advisable to extend its cultivation in the manner proposed by Mr. Broughton. The Superintendent Government Chinchona Plantations will be requested to advise as to the best mode of filling up the vacancies among the *C. Succirubra*. It is observed that Mr. Howard writes in high terms of *C. Officinalis*, and Mr. Broughton believes "the final success of chinchona cultivation on the Nilgiris will result from the export of these crown-barks." Rather than add to the stock of *C. Calisaya*, it seems preferable to increase the cultivation of *C. Officinalis* by growing the varieties especially noted for their excellence by Mr. Howard.

12. It is important to consider the best mode of disposing of the different kinds of bark when harvested. *C. Succirubra* has been declared on the best authority *not* to be the quinine-producing tree of the family, but it yields the other alkaloids in greater proportion. Its bark still fetches a high price in the English market; but Mr. Broughton says emphatically, "It appears to be the worst species for the production of bark for export;" and Mr. Howard dwells on the importance of regarding it as a "chinchonidine-producing material." The Government, therefore, consider that only so much of this bark should be sent to England as may be needed for special purposes, *e.g.*, analysis, testing of market value, and so forth; the bulk being retained here for conversion into sulphate of chinchonidine for the use of the native population who cannot afford to buy quinine. His Excellency in Council concludes that Mr. Broughton will have no difficulty in using up all available bark of this one species, but he will report on this point. If he cannot do so the surplus must be sent home. The crown and other barks, on the other hand, should be chiefly shipped to England, as their quinine-yielding properties render them especially valuable there. Of course the shipments of *succirubra* bark cannot be immediately stopped, but the course above indicated should be the guiding principle, *viz.*, that the red barks should be regarded as the source of supply of cheap febrifuge for India, while the crown and other quinine-yielding barks should be reserved for the Home market.

13. The enclosure to Mr. McIvor's letter to the Commissioner gives the prices which the Nilgiri bark has realised in England compared with those obtained for Java bark at Amsterdam. Mr. Broughton laid special stress on the enhanced price fetched by some Java *calisaya* bark; but it is observed that the Indian crown barks were sold at even a higher figure, and the general average of the Nilgiri is, as Mr. McIvor points out, considerably greater than that of the Java bark.

14. It is also noticed that some branch crown bark sent, as stated by Mr. Broughton, contrary to his advice, and (the Commissioner adds) rejected by him as unfit for the use of the factory at Neddivuttum, realised from 2*s.* to 3*s.* 6*d.* per lb. This result naturally suggests a doubt as to whether there is not some defect in the process of manufacture now in operation, owing to which all the alkaloids are not extracted from the bark. In the sample thus rejected there must, judging from the price realised, have been 2 per cent. of quinine. The subject is very important, and merits serious consideration, for on it turns the question whether the manufacture should be carried on here or in England. It was stated as one reason for working up the material on the spot that bark would be utilised which it would not be worth while to export, but the instance noted does not bear this out.

15. His Excellency the Governor in Council resolves to depute Mr. Cornish and the Commissioner of the Nilgiris to inquire and report on the subject so soon as Mr. Broughton returns from leave, in order that the efficiency of the factory may be determined, and a satisfactory solution be arrived at upon the question whether the existing arrangements should be continued. The points for special inquiry are (1) the cost and (2) the medicinal value of the product. In regard to the former, it should be considered how much of Mr. Broughton's salary should be debited to the factory.

16. The Surgeon-General, Indian Medical Department, will be desired to forward some of the amorphous quinine already issued for experimental trial, in order that it may be submitted for analysis and valuation to Mr. Howard and Dr. DeVrij.

17. The samples of barks called for in Government Order, 15th December 1873, No. 1,428, have, it is observed, not yet been forwarded.

18. The Government will be obliged to the Commissioner for a full report on the subject of the plantations, &c., up to date.

Enclosure 6, in No. 40.

Read the following Letter from the Government Quinologist to the Acting Secretary to Government, Revenue Department, dated Ootacamund, August 1873:—

I HAVE the honour to forward a report, which is concerned mainly with the changes of growth and age on the various species of chinchona on the Government plantations. I request that I may be allowed to correct the printer's proofs before publication, and be furnished with three copies of the same on publication.

2. It may justify the suggestion made in paragraph 14 of this report, if I quote certain reasons other than I have stated in report. I have received a set of specimens of the Java barks, of which those of *C. Calisaya* are of admirable appearance. The attention of the Netherlands Government is now almost exclusively directed to this species, the extension of the cultivation of *C. Succirubra* being discontinued. Certain specimens of *C. Calisaya* have sold in Amsterdam for the extraordinary prices of 8*s.* to 9*s.* 5*d.* per

kilogramme, or 3 s. 7½ d. and 4 s. 3¼ d. per lb. I quote an analysis of certain bark from a tree, seven years of age, which I have made of Java bark, the seed of which was derived from the same source as the plants of the Madras Government:—

	Per Cent.
Total alkaloid - - - - -	7.65
Quinine - - - - -	6.91
Chinchonidine and chinchonine - - - - -	6.74

The quinine yielded the usual amount of sulphate.

This bark, therefore, is of better quality than any grown on our plantations, with the exception of var. *Angustifolia*, though I fully believe that as good would be obtained on suitable sites of growth.

From the Government Quinologist, to the Acting Secretary to Government, Revenue Department, Fort St. George; dated Ootacamund, 22nd August 1873.

Subject of Report.

I HAVE the honour to report in the following pages on the present state of the various chinchona species growing on the Government plantations, in order to trace the changes produced by age and growth on the several kinds.

Changes in *C. Succirubra* up to 1871.

2. I will commence with the species which has generally the largest contents of alkaloids in its bark, and the quickest and most vigorous growth. I allude to the *Cinchona Succirubra*, of which on the plantations there are 579,938 trees of various ages. I quote below the results already obtained with the bark of oldest trees examined in May, or the time of year in which the yield is greatest. These trees were planted out in August 1862:—

	1868.	1869.	1870.	1871.
Total alkaloids - - - - -	6.74	7.43	7.60	7.85
Total sulphates obtained - - - - -	6.06	6.43	6.00	5.45
Quinine - - - - -	2.40	1.72	1.73	1.80
Chinchonidine and chinchonine - - - - -	4.34	5.71	5.87	6.05
Sulphate quinine, obtained crystallised - - - - -	2.21	1.51	1.40	1.15
Sulphate chinchonidine, obtained crystallised - - - - -	2.85	4.92	4.60	4.30

Subsequent changes.

3. During the months of May 1872 and 1873 similar careful analyses have been made. As the variation in the bark of *Succirubra* in single trees, though generally slight, is occasionally marked, a mean of two or more analyses has been taken, each being performed on the bark of six trees. The height of trunk from which the specimens were taken has been, as far as possible, the same throughout the whole series, so that now the trees are 30 feet in height, the bark has become that from the lowest portion of the trunk. As the later analyses appear to show an increase in chinchonine at the expense of chinchonidine, I have paid special attention to the examination of that point. I quote the analyses for 1872 and 1873:—

	1872.	1873.
Total alkaloids - - - - -	7.67	7.38
Total sulphates obtained - - - - -	4.96	3.84
Quinine - - - - -	1.49	1.31
Chinchonidine and chinchonine - - - - -	6.18	6.07
Sulphate quinine, obtained crystallised - - - - -	1.10	0.83
Sulphate chinchonidine, obtained crystallised - - - - -	3.86	3.01

4. I can but conclude from the foregoing analyses that the oldest bark on our oldest trees of *C. Succirubra* has passed its age of maximum yield of alkaloids, and from the same indication it appears to be even deteriorating in total yield of alkaloids. This deterioration is, however, but slight, and it is even possible may have occurred in part from the influence of the monsoon this year, which has been of unusually early occurrence. In paragraph 37 *et seq.* of a report published in return "Chinchona Cultivation," 1870, page 241, I have shown the considerable influence the rainy season has on the amount of alkaloid in the bark. But as the growth of the bark of this age is mainly an increased development of liber fibres and not of the cellular tissue, which is the main seat of the alkaloid, I incline, on a further ground, to the opinion that a diminution of the per-centage of alkaloids will ensue, though it may be but slight.

Red-bark trees have passed the time of greatest yield in their oldest bark.

5. The foregoing analyses also indicate another change in the yield of our red barks with increase of age. This is that the amount of chinchonine is increasing, and that of chinchonidine is decreasing. As I have consistently excluded chinchonine sulphate from the amount of crystalline sulphates in all previous analyses, this will be evident in the foregoing *résumé* of analyses. But this change in the bark will be somewhat more obvious if I state the analyses of 1871 and 1873 in the following form, which is readily done by appropriate calculation. The numbers will be approximately accurate:—

The chinchonine is increasing at expense of chinchonidine and quinine.

	1871.	1873.
Total alkaloids - - - - -	7.85	7.38
Consisting of:—		
Chinchonidine - - - - -	3.22	2.25
Chinchonine - - - - -	2.83	3.82
Quinine susceptible of crystallisation - -	0.95	0.68
Quinicine - - - - -	0.85	0.63

This form of statement takes no account of chinchonidine or chinchonine unsuceptible of crystallisation which exists in small quantity in the bark. But it will here be evident that in two years the amount of chinchonidine has diminished 1 per cent., while chinchonine has increased nearly in the same proportion. The amount of true quinine has also diminished by 0.27 per cent. in the same period.

6. In a report by Mr. Howard, dated 16th January 1872, in which, by the request of the Secretary of State, he discussed certain matters mentioned in a report of mine which is attached to Government Order, No. 1,686, of 26th September 1871, occurs the following:— "It is needful to remark that the waste of alkaloid which has been apparent to the writer in the examination of South American bark of the age perhaps of one or two centuries has not yet taken place in these still young Indian specimens." From the foregoing analyses I fear it will be apparent that the process of the waste of alkaloids mentioned has begun, and that it commences after the ninth year of the age of the plant. It is probable that the waste really begins from the first year, but that the rapid simultaneous formation of alkaloid by the plant in its earlier years prevents its being noticed, the processes of formation and waste going on side by side.

Present yield of oldest red bark corroborates Mr. Howard's statement.

7. I do not apprehend this deterioration in the quality of the red bark by age will be of essential importance for some years to come, since younger bark is forming constantly on the same tree, though this younger bark never appears quite equal that of the best trunk bark of young trees. Though I quite recognise the fact that *C. Succirubra* is the chinchona which produces the largest amount of alkaloid in the shortest time, it appears to be worst species for the production of bark for export. As it is in no respect the best source for the preparation of crystalline sulphates of its alkaloid, I feel convinced the time will come when it will no longer even be worth while to export it from the Government plantations.

Objection to the growth of red bark.

8. The superintendent of the plantations has, with much judgment, planted out a few dozen *C. Succirubra* trees on the plantation of Dodabet. In this comparatively cold climate their rate of growth quite forbids any expectation of their profitable cultivation. But they have the great interest of indicating the influence of a low temperature and high elevation on the formation of alkaloids in the bark of a variety which is the inhabitant of a warm climate. Hence, as soon as their bark was sufficiently formed, its analysis possessed much interest. The trees from which it was taken were eight years old, but of stunted growth. I subjoin its results:—

Red bark at high elevations.

Total alkaloids - - - - -	3.16
Quinine - - - - -	0.75
Chinchonine - - - - -	2.14
Sulphate quinine, obtained crystallised - - - - -	0.55

The bark was thus comparatively poor in alkaloids. The effect of the climate and slowness of growth has thus also the remarkable effect of quite preventing the formation of chinchonidine. The bark is of little value, but its analysis demonstrating the effect of elevation has, I submit, considerable interest.

Extensive cultivation of *C. Succirubra*.

9. In the "Gottingen Jahresbericht über die Fortschritte der Pharmacognosie," 1871, in addition to Sikkim, Ceylon, Kangra in India, the success of *C. Succirubra* is detailed in Jamaica, St. Helena, Réunion. The reports from Java give similar details. As this species is of easy cultivation in most tropical table-lands with moist climate, there is no doubt it is now grown to a greater extent than the European market requires. I believe that more is now flourishing on the Nilgiris than will be required in England for the manufacture of pharmaceutical preparations. By the quinine manufacturer it will be little used as long as barks richer in quinine are obtainable.

C. Officinalis.

10. *C. Officinalis* is the kind next in commercial importance, the plantations containing, according to the statement of the superintendent, 508,878 plants. I have in former reports had occasion to speak in high praise of this species as a quinine-yielding kind. From the great variability in its quality of bark, it is not possible to state the changes therein taking place with the same precision as is the case with *C. Succirubra*. I beg to quote the following analyses, as representing results obtained in an attempt to obtain the mean yield of alkaloids in the bark of the lower part of the trunks of the oldest trees and those of nine years of age:—

	Oldest Trees about Ten Years of Age.	Trees about Nine Years old.	Neddivuttum, Nine Years old.
	1	2	3
Total alkaloids - - - - -	7.39	8.33	5.24
Quinine - - - - -	3.81	4.52	4.17
Chinchonidine and chinchonine - - - - -	3.58	3.81	1.07
Quinine sulphate, obtained crystallised - - - - -	3.67	4.35	undetermined.
Chinchonidine, " " - - - - -	1.58	1.40	"

The above admirable results show that at present in mere yield of alkaloids certain of the crown barks equal that of *C. Succirubra*, while it far surpasses the latter as a source of quinine. It has every excellence in the ease with which sulphate of quinine can be prepared from it.

Success of chinchon cultivation will depend on *C. Officinalis* on Nilgiris.

11. The final success of chinchona cultivation on the Nilgiris will result from the export of these crown barks. The tree has the disadvantage of comparatively slow growth, and the bark of its branches is nearly valueless. The analyses, of course, show that no cessation of the formation of alkaloids or any deterioration of quality is yet apparent from the increase of the age of the bark. Analysis 2 really shows a somewhat abnormal yield.

Roots of *C. Officinalis*.

12. I have been able to obtain specimens of the bark of the secondary and main roots of this species. The specimen was from the Belmont plantation at Ootacamund. The latter will represent the quality of similar bark on the Government plantations. I state both analyses:—

	Belmont, No. 1.	Belmont, No. 2.
Total alkaoids - - - - -	7.65	11.17
Quinine - - - - -	0.42	4.27
Chinchonine and chinchonidine - - - - -	7.23	6.90
Quinine sulphate, obtained crystallised - - - - -	undetermined	3.54
Chinchonidine - - - - -	0.59	4.40

The foregoing remarkable results show the extraordinarily large amount of alkaloids contained in the bark of the roots. Ten years ago the analyses of Dr. de Vrij showed that in the *C. Pahudiana* of Java the root bark surpassed that of the stem in its yield of alkaloids, though the increase was far less marked. The greater part of the alkaloids, however,

however, consists of chinchonine, though in the second analysis the yield of quinine is also large. I am, however, of decided opinion that, on account of the expense of procuring the bark, that the roots will scarcely be a profitable source of alkaloids, notwithstanding its enormous yield. The physiological explanation of this peculiarity is discussed in paragraph 20. The roots of *C. Succirubra* have been examined by me, and results enumerated in report, appearing at page 117 of Chinchona Return, 1870, and by Mr. Howard in his report, dated 1st September 1868.

13. I may here detail a singular result obtained with a peculiar variety of what appears to be *C. Officinalis*. This species, as I have in earlier reports remarked, seems to possess a large number of varieties, one of which, named by Dr. Weddell var. *Angustifolia*, I have shown in a report appearing in "Chinchona Return, 1870," page 205, is the most valuable kind of chinchona known. The kind now under discussion was brought to my notice by Mr. McIvor, who thought it to be the real parent of what is called the hybrid between *Succirubra* and *Officinalis*, an opinion quite contrary to mine. It has large leathery leaves and peculiar aspect. Its bark gave the following results on analysis: total alkaloids 1·25 per cent., of which the whole was chinchonine, not even traces of quinine or chinchonidine being apparent. This bark thus has the composition of a grey bark, but with a totally different appearance, and is certainly not the source of the hybrid mentioned. Of course the kind is almost destitute of value; but from its remarkable character it is well worthy of notice, and I propose to send a specimen of its flower, foliage, and bark home for botanical notice.

Special variety of crown bark.

14. The kind of chinchona next in importance is the *C. Calisaya*, of which I am glad to learn from the superintendent of the plantations as many as 33,850 are planted out. Like *Officinalis*, the number of varieties of this is very great. In a report attached to Government Order, No. 1, 686, of 26th September 1871, I had the honour of stating the special kind (with leaves red on the under-surface) that was the best worth cultivation. At end of May last I made the analysis of bark taken from six of these trees, which gave the following results:—

Total alkaloids	-	-	-	-	-	-	-	-	-	5·30
Quinine	-	-	-	-	-	-	-	-	-	3·00
Chinchonine and chinchonidine	-	-	-	-	-	-	-	-	-	2·30
Quinine sulphate, obtained crystallised	-	-	-	-	-	-	-	-	-	2·81
Chinchonidine	-	-	-	-	-	-	-	-	-	0·75

Hence this bark, though two years younger than our second age *Officinalis*, nearly equals it in value. *Calisaya* is the species that has the greatest reputation of any of the chinchonæ in the European market, and this reputation is justified by the foregoing and former analyses. I have mentioned in paragraph 11 the worthlessness of the branch bark of the erect-growing *Officinalis*. The somewhat shrubby habit of *Calisaya* produces many branches of which the bark presents a good appearance. To ascertain its quality, bark was taken from a quantity of secondary, not primary branches, and analysed. These, when quite fresh, did not lose so much weight on drying as the trunk bark of *C. Succirubra*. The analysis was as follows:—

C. Calisaya.

Total alkaloids	-	-	-	-	-	-	-	-	-	2·71
Quinine	-	-	-	-	-	-	-	-	-	2·40
Chinchonidine and chinchonine	-	-	-	-	-	-	-	-	-	0·31

The bark, therefore, notwithstanding its youth, is fully equal to good South American *Calisaya* in yield of quinine. I anticipate much success from the export of this species when of fit age. The Netherlands Government appear to be carrying out its cultivation largely, having obtained the original seeds from the same source as the Madras Government. I would strongly recommend that in all suitable spots, where a tree of *C. Succirubra* has died from any cause, a plant of *Calisaya* should be substituted in its place. It appears to me to have been unfortunate that chinchona cultivation should have been so greatly occupied with *C. Succirubra* at its commencement.

15. The amounts of water which the several kinds of bark when green lose on drying is an important datum in comparative estimates of their value for cultivation. In all analyses of chinchona bark the amounts of alkaloids are invariably stated in per-centages of quite dry bark. But the fresh bark of several species of chinchona yield different amounts of dry bark. Though different specimens of the same bark contain variable amounts of water, the quantities of true dry bark yielded by the oldest trunk bark of the various species largely grown on the Government plantations is, roughly, as follows:—*C. Officinalis*, 36 per cent.; *C. Calisaya*, 33 per cent.; *C. Succirubra*, 30 per cent. These proportions vary with the weather and the season of the year, but generally preserve the same relation to one another. It will be observed that this furnishes another advantage possessed by *C. Officinalis*, and in some measure compensates for the slower growth of the species. I quite believe when our trees of *C. Calisaya* are of the same age they will equal those

Water in chinchona barks.

those of *C. Officinalis* in this respect. The advantage of a smaller loss of weight on drying for export needs no explanation. Ordinary bark of the market contains from 10 to 12 per cent. of water.

Bark lately
exported.

16. As I am desirous of making some remarks on the barks lately exported, I beg permission to quote a statement of the analyses of samples of each kind which I have already communicated to Government:—

	Mossed Red Bark, Neddivuttum.	Renewed Red Bark, Neddivuttum.		Red Bark, Neddivuttum.	Red Bark, Pykara.	Branch Red Bark.	Crown Bark, Neddivuttum.	Crown Bark, Pykara.	Mossed Crown Bark, Dodabetta.	Crown Bark, Dodabetta.	Branch Crown Bark.
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
Total alkaloids - - - -	6.20	5.82	2.75	4.45	5.11	3.58	4.32	3.42	6.60	3.61	0.91
Quinine and quinicine - -	1.14	3.25	-	1.31	0.97	1.93	3.08	2.32	3.89	2.07	-
Chinchonidine and cinicine -	5.06	2.57	2.75	3.14	4.14	2.25	1.24	1.10	2.71	1.54	-
Pure sulphate quinine, obtained crystallised - - - -	0.74	2.62	-	0.74	0.62	0.81	3.11	2.39	3.86	2.04	-
Pure sulphate chinchonidine, obtained crystallised -	3.47	0.88	1.	1.61	2.22	1.14	0.85	0.67	1.	0.99	-

Of these, I would first remark that the mossed and renewed red barks from Neddivuttum (Analyses 1 and 2) are of the best the plantation affords, being mainly taken from the experimental trees. The natural red bark from Neddivuttum (Analysis 4) is however inferior, being taken either from the upper part of the trunks, or from younger trees. From its inferior quality it will not, of course, find an equal price with our better bark. The natural red bark from Pykara (Analysis 5), though from young trees, is of higher quality. The crown barks from Neddivuttum and Pykara (Nos. 7 and 8), afford indications in a high degree encouraging, and demonstrate the success of the species in a warmer climate than Ootacamund. For some years this species remained nearly stationary in growth at Neddivuttum, and the analyses of its bark were less encouraging than that obtained from Dodabet; but during the last three its growth has become more rapid, and the amount of true quinine in its bark has increased. I am glad to report that in none of our plantations am I now disposed to limit the success that will accrue from this excellent species. I would, however, remark that the crown bark from Pykara and Dodabet is of considerably inferior yield to what it would have had if the trees producing it had been allowed two years' further growth before cropping. While I am of opinion that duplicate stems should be removed, I can see little gain that can accrue to chinchona cultivation by exporting bark that has not yet come near its full yield of quinine. The natural crown bark from Dodabet is from younger trees than that furnishing the mossed bark.

Grey bark exported.

17. The grey bark has been sent home in but small quantity; its analysis (No. 3) shows that it is of by no means superior quality, but is equal to that usually sent from South America. It appears to be mainly obtained from *C. Peruviana*, from the considerable amount of chinchonidine it contains.

Order of formation
and conversion of
alkaloids.

18. In the whole chinchona genus cultivated on the Nilgiris, with the exception of the grey barks, certain definite changes appear to take place which I have formerly mentioned,* and now desire to enumerate with greater precision. These were first made evident by the examination of bark naturally renewed, and have been, on the whole, corroborated and extended by careful observation and analysis during the last five years. The general principle is as follows:—The alkaloid first formed in the bark of all the species, except the grey barks, is uncrystallisable quinine or quinicine. This alkaloid quickly in *C. Officinalis*, and less quickly in *C. Succirubra*, changes into pure crystallisable quinine. Again, after a time, with much rapidity in *C. Succirubra*, and with great slowness in *C. Officinalis*, this quinine changes into chinchonidine. Finally, after a considerable lapse of time, the chinchonidine changes into chinchonine, the last form in which the alkaloid as such exists. The composition of each of these alkaloids is so nearly identical that I am convinced I am accurate in speaking of their actual conversion in the tissues of the living bark. Warmth of climate accelerates these changes, which all go on simultaneously; hence, in low-grown *C. Succirubra* the amount of quinine is smaller than in bark grown at high elevations, and the amount of chinchonine also is larger. I have never yet met with a specimen of this bark destitute of quinine, though in unhealthy trees, where its formation has nearly ceased, it is but very small in amount, while that of chinchonine is large.

* Return "Chinchona Cultivation," 1870, pp. 194, 242.

large. The same results are remarkable in trees of *C. Officinalis* in warm climates when the growth is slow, as the bark then contains little quinine.

19. If a tree of *C. Succirubra* on the Nilgiris be in a state of rapid and vigorous growth, a more considerable amount of quinicine and quinine is found in its trunk bark, as their formation is then more rapid than the transformation of those alkaloids into chinchonidine. In a vigorous growing *C. Officinalis* tree this peculiarity is most marked, as the bark of such trees is invariably rich in quinine, the change of that alkaloid into chinchonidine being slow in this species. On the other hand, if a slow-growing and stumpy tree be selected for analysis, the alkaloid in its comparatively inactive bark tissues will be found to be in large amount chinchonidine and chinchonine, the quinine having been changed into those alkaloids faster than it is formed. In the whole species of chinchona, I have reason to believe these changes are similar in nature, but differ in degree, according to the habit of the plant.

Certain evidences of order of formation and conversion.

20. In former reports I have stated abundant reasons for my belief that sunlight is one considerable agent in the final destruction of the alkaloids. When the tree is young, and the bark is thin, this destruction is rapid, but the vigour of formation is so also. Hence the great improvement in the bark produced by mossing young trees. As the bark gets thicker by increase of age, one great cause of the destruction of alkaloids is diminished in its action, but the processes of growth are locally less vigorous in the thicker epiderm protected by a thicker cork, and thus the gain of mossing disappears. This condition appears to take place in about the eighth year of growth. In the bark of the roots which are, during their whole existence, entirely secured from light, the alkaloids accumulate in large amount, though the chemical transformations mentioned in the preceding paragraph of course occur. Hence, the alkaloids to be found in the root bark are large quantities of alkaloids consisting mainly of chinchonine and chichonidine.

Destruction of alkaloids.

ORDER of the Madras Government thereon, 15th December 1873.

ORDERED, that the foregoing letter and a copy of Mr. Broughton's report be forwarded to the Commissioner of the Nilgiris, with a view to his obtaining and forwarding, at an early date, with his own remarks, any observations on it that the Superintendent of Chinchona Plantations may wish to make.

2. The Commissioner will also, in communication with Mr. Broughton, select and forward to the Government carefully prepared samples of the different barks now reported upon, taking care that they are procured from trees of the same age, and grown under similar conditions in the matter of soil, elevation, aspect, and culture generally.

Enclosure 7, in No. 40.

From the Committee appointed under Government Order, No. 759, of 22nd June 1874, to Report on the Efficiency of the Chinchona Factory at Neddivuttum, to the Secretary to Government, Revenue Department, Fort St. George; dated Ootacamund, 28th November 1874.

WITH reference to Government Order, No. 759, of the 22nd June 1874, we have the honour to submit the following report.

2. Two questions have been submitted to us for opinion:—

(a.) The cost of manufacturing chinchona alkaloids under Mr. Broughton's superintendence at Neddivuttum.

(b.) The medicinal value of the locally prepared alkaloids.

3. In regard to the latter question the Sanitary Commissioner is responsible for the remarks made.

4. With regard to the first question, we may note that doubts have been suggested as to the profitable extraction of alkaloids in this country, by the fact that certain parcels of branch chinchona barks or prunings which were sent home in 1873 fetched from 2s. to 3s. 6d. per lb. in the open market.

5. The history of these branch barks, so far as we can gather, is as follows:—

Eleven cases of branch bark of the *C. Succirubra* from the Neddivuttum and Pykara plantations were included in the exports of 1873. This bark weighed, according to invoice lists, 1,765 lbs., but in the sale accounts quoted by Mr. McIvor in Government Order,

No. 759, of 22nd June 1873, only nine cases of branch red bark, weighing 1,327 lbs., are referred to, the prices of which were as below:—

			s.	d.
7 cases,	972½ lbs.,	sold at - - -	2	3
1 case,	194 „ „	- - -	2	2
1 „	161½ „ „	- - -	2	-

Vide Government
Order, No. 955,
dated 8th September
1873.

Mr. Broughton's analysis of samples of this branch bark showed it to be of superior quality to the ordinary run of prunings supplied to his manufactory. He found that the total alkaloids averaged 3·58 per cent. of quite dry bark, of which 1·33 per cent. was quinine and quinidine, and 2·25 per cent. chinchonine and chinchonidine. In regard to the per-centage of pure sulphate of quinine "crystallised," this branch red bark gave more favourable results (0·81 per cent.) than certain samples of trunk bark from Pykara and Neddivuttum exported in the same consignment. Branch bark of this quality would be suitable for the manufacture of alkaloid, but there is no evidence before us to show that it was bought for manufacturing purposes.

6. In addition to the 11 cases of branch bark of the *C. Succirubra* sent to London in 1873, Mr. McIvor dispatched by the same opportunity 13 cases of branch bark of the *C. Officinalis* (crown bark). The gross weight of this branch crown bark is stated at 2,115½ lbs. Ten of the cases contained branch bark from the Dodabetta estates, and three cases contained branch crown bark from the Neddivuttum plantations, which is stated by Mr. McIvor to have been rejected by Mr. Broughton as useless for manufacturing purposes.

The prices realised for this branch crown bark were as follow:—

			s.	d.
2 cases,	466 lbs.	from Dodabetta -	3	6 per lb.
9 „	1,341½ „	{ 6 „ Dodabetta -	2	6 „
		{ 3 „ Neddivuttum		
2 „	308 „	„ Dodabetta -	2	4 „

7. In Government Order, 8th September 1873, No. 955, Mr. Broughton reports only one analysis of branch crown bark, which gives the total alkaloids as 0·91 per cent. This analysis, Mr. Broughton states to us, had reference to the branch crown bark which he objected to work up in his factory, and not to the produce of the Dodabetta estates; and he explains that the invoice lists of cases exported only reached him after the dispatch of the bark. On this point, however, there is a difference of opinion between Mr. McIvor and Mr. Broughton. The former believes that Mr. Broughton's analysis, showing 0·91 per cent. of alkaloid, referred to the Dodabetta produce; and he supports this view by quoting a letter from Mr. Broughton, dated 7th June 1873, in which the latter states: "I have the honour to state that the bark of *C. Officinalis* from Dodabetta plantations obtained from branches and double stems is of too poor a quality to be exported to England. I would recommend that the elder pieces of bark be picked out, and they only sent."

Mr. Broughton, however, informs us that, to the best of his recollection, samples of this Dodabetta branch bark were not analysed by him, and that the opinion he gave as above was founded on his general knowledge of the qualities of bark. There has evidently been some misunderstanding in regard to the analysis of this branch crown bark, and we allude to the subject here because the prices obtained for it seemed to be out of proportion to the alkaloidal value of the bark according to the one analysis given by Mr. Broughton. The selection of samples, so as to represent the average proportion of alkaloid in a case of bark, evidently requires to be arranged with the utmost care. It is not clear to us that the samples of branch crown bark from the Neddivuttum and Dodabetta estates were separately analysed by the Government Quinologist, as was the case with the other barks exported.

8. Mr. Broughton, in Government Order, No. 955, of 8th September 1873, states, with reference to the branch crown barks exported, "certain branch crown bark has been sent, contrary to my advice, given under the belief that, even if it sell for a good price, its quality will ultimately prejudice the reputation that Madras chinchona bark should seek to obtain in the market."

9. These parcels of bark brought an excellent price in the home market, ranging from 2s. 4d. to 3s. 6d. per lb.; but there is nothing in this fact to indicate that the branch bark was bought by alkaloid manufacturers. (The sale lists sent out by the Home Government are defective, in not furnishing the names of buyers of the several lots of bark; and, in future, we think that the fullest information of this nature should be furnished to the local officers for their guidance.)

10. We must state here, for the information of Government, that there is a steady demand in Europe for chinchona barks, irrespective of their value to the manufacturer of alkaloids. According to information before us, about 100,000 lbs. of bark are used annually in the United Kingdom by druggists, and probably five or six times that amount

by

by continental druggists. Bark of this character is bought for making tinctures, decoctions, essences, and other pharmacopœial preparations. The dealers value it according to its appearance, *i.e.*, the size of the quills, the character of the lichens on the surface, its colour, shape, and other peculiarities, and not according to its amount of alkaloid. The branch crown bark sent home in 1873 was probably bought altogether for druggists' use. Two of the cases, it will be observed, sold for 1*s.* and 1*s.* 2*d.* per lb. beyond the average prices,—a tolerably sure indication that the high price obtained was no measure of the value of the sample for the quinine manufactory.

11. It is important that this point should be clearly understood, that chinchona barks have a value of their own independently of their fitness for the quinine manufactory. How long dealers may be willing to pay high prices for barks of low alkaloid yielding value it is impossible to say. If the market is overstocked with bark fit only for druggists' use, the present high prices cannot be maintained. We notice in a late circular of drug sales that inferior barks have been sold as low as 4*d.* and 2*d.* per lb.—prices which would be unremunerative to the Indian grower of chinchona. The ultimate success of chinchona cultivation in India must depend upon our ability to produce a bark that shall yield a high proportion of alkaloid, suitable for extraction by quinine manufacturers, and not upon the production of low-class barks which are bought by druggists.

12. It will be remembered that in the first sales of Nilgiri barks, the parcels being small, dealers were guided by appearance rather than by chemical value. The mossed bark, rich in alkaloid, fetched only 2*s.* 3*d.* per lb., while the unmossed, the appearance of which commended itself to dealers, fetched 2*s.* 9*d.* and 2*s.* 10*d.* per lb. The buyers for manufacturing purposes are now acquainted with the appearance of mossed barks, and value them according to analysis. Barks containing a workable amount of alkaloid are valued according to their composition, while barks for druggists' use are esteemed on other considerations altogether. Bearing these facts in mind, we are not disposed to over-estimate the circumstance that our crown branch barks sold at remunerative rates. We know that the prices of barks for druggists' use fluctuate in the London market from 4*d.* to 4*s.* per lb., according to the peculiarities of the samples. The Indian barks of this kind have mostly sold for remunerative prices up to the present time, and the quantities the Nilgiri plantations may be expected to yield will not, if thrown into the London market, in our opinion, affect it in any way, or fetch lower prices than hitherto. We think it right to add that, under the mossaing system, the proportion of branch bark taken to trunk bark will yearly diminish. Last year it was about half of the total bark harvested. Mr. McIvor estimates that not more than 10,000 lbs. of branch bark will be available next year.

13. We come now to consider the cost of manufacturing alkaloids on the plantations.

14. The supply of green bark and outturn of alkaloids, as given by Mr. Broughton in his letter (Government Order, No. 408, of 1st April 1874), are as follow:—

		Green Bark used.	Alkaloid produced.	Per-centage of Yield of Green Bark.
		Lbs.	Lbs.	
1869-70	- -	17,793 - - - -	21½	·12
1870-71	- -	51,352 - - - -	127	·24
1871-72	- -	35,072 {branch, 12,829 trunk, 22,243}	100	·28
1872-73	-	80,289 {branch 46,440 trunk 33,841}	345	·43
1873-74	- -	91,773 - - - -	Results not completed.	

(Owing to some defect in manipulation, the lime precipitate of the bark supplied in 1873-74 has not yet been fully worked up. Up to the present time 168·12 lbs. of alkaloid have been obtained, and the estimate of the unworked quantities is 142 lbs., or a total outturn of 310·12 lbs. of amorphous alkaloid for the year.)

15. From these results we see that there has been a gradual improvement in the proceeds of manufacture in the four years for which the data are complete, from ·12 per cent. of alkaloid to ·43 per cent. in 1872-73. The results for 1873-74 do not show quite so well as those of the former year; but this appears to have been due partly to inferior bark, and partly to a modification of manufacture intended to prevent waste of alkaloids, but which, in practice, failed to secure this object.

16. The quality of the bark supplied to the factory in 1869-70 and in 1870-71 is not stated.

stated. During these years the factory work was irregular, and often interrupted; but in 1871-72 and 1872-73 the quality of bark is noted below:—

					Branch.	Trunk.
					Lbs.	Lbs.
1871-72	-	-	-	-	12,829	22,243
1872-73	-	-	-	-	46,440	33,841
					59,269	56,084

From experiments conducted in the drying of bark, it would seem that trunk bark loses from 55 to 65 per cent. of water before it is fit for export, and branch bark from 60 to 70 per cent. of water. Calculating from means of samples reported on in the year 1873, we assume that 100 parts of green trunk bark would, when dry for export, diminish to 38 parts, and green branch bark from 100 to 34. Assuming these proportions to represent the average decrease by dryage, we find the quantity of commercially dry bark used in the factory during 1871-72 and 1872-73 as follows:—

						Lbs.
Dry trunk bark	-	-	-	-	-	21,311
Dry branch bark	-	-	-	-	-	20,151

17. The trunk bark, if sent into the London market, would have fetched from 2s. to 3s. per lb. But from figures before us we find that the cost of carriage, export, dock dues, charges, deductions, &c., for the better qualities of bark, vary from 6d. to 1s. per lb., and as only the net price of the bark can be a fair debit against the factory, we assume this on the average at 2s. or a rupee a pound of commercially dry bark.

18. In regard to the prunings, the analysis of each sample received by Mr. Broughton in 1872-73 showed that whereas the trunk bark used in the factory yielded about 5 per cent. of alkaloid to the weight of bark completely dried, the prunings, taking the average of 12 samples, yielded only 1.3 per cent. of total alkaloids in analysis. We have already indicated that the branch barks have a value independent of the amount of alkaloid they contain; but for manufacturing uses we are bound to consider their value in relation to their yield of alkaloids. In this aspect, if the trunk red barks sold for an average of 2s. 8d. per lb. in London, the manufacturers would be only able to afford 8d. or 10d. per lb. for branch bark of the quality used in the factory. Allowing for charges of export, &c. on these low-priced barks (averaging from 3d. to 5d. per lb.), we shall not be far wrong if we debit the factory with 6d. per lb. as the net value of the dry prunings used.

19. These prunings, we may add, in the present condition of the bark market, would have been disposed of to greater advantage if they had been shipped to Europe for other than manufacturing purposes. Our object in this place is merely to estimate the manufacturing value of the raw material consumed in the production of the rough mixed alkaloids.

We have, therefore—

				£.	s.	d.
21,311 lbs. dry trunk bark, at 2s.	-	-	-	2,131	10	-
20,151 lbs. dry branch bark, at 6d.	-	-	-	503	16	-
Total	-	-	£.	2,635	6	-

20. These may be taken as approximate prices, after deducting all costs of transport and trade charges, and considering also the dubious quality for manufacturing purposes of much of the branch bark obtained by pruning the trees. We may, therefore, take 2,500*l.* as representing the actual manufacturing value to Government of bark supplied on the spot to the alkaloid factory in 1871-72 and 1872-73.

21. The actual outturn of mixed alkaloids from the bark used in these two years, 1871-72 and 1872-73, was 445½ lbs. The market value of the product is not known, but, as in the medical administration of this country, the rough mixed alkaloids are used, and have actually replaced about an equal weight of sulphate of quinine, which would otherwise have been bought and shipped to India on account of the State, we have some data for calculating the advantages or disadvantages of local manufacture.

22. The price of sulphate of quinine varies from month to month and year to year; but, according to recent price lists furnished by Mr. Howard, and allowing a moderate percentage

percentage (10 per cent.) for freight, insurance, and other charges of conveyance to this country, we may calculate the cost of landing the drug in our medical stores at 130s. per lb.* The value of 445½ lbs. of sulphate of quinine, therefore, at this rate would amount to 2,895*l.* 10*s.*, or about 395*l.* 10*s.* more than the net manufacturing value of the bark consumed in the production of 445½ lbs. of rough mixed alkaloids.

23. The cost of the alkaloid factory establishment for 1872-73, including subsequent expenses in working up the product of that year (345½ lbs.) is given, on Mr. Broughton's responsibility, as *Rs.* 2,823. 11*a.* 9*p.*; and it is only fair to assume that if the establishment had been in full work, the 100 lbs. of alkaloid made in 1871-72 would not have cost more in proportion, or about *Rs.* 8. 2*a.* per lb. in manufacture. (It must be remembered that the factory was designed, with its present establishment, to turn out about 800 lbs. of rough alkaloids per annum; but, so far, the bark supplies have not been in quantity sufficient to allow of the complete utilisation of the establishment.) The charges for manufacture of 445½ lbs. of mixed alkaloids have been, so far as we can ascertain, as follows:

	<i>Rs.</i>	<i>a.</i>	<i>p.</i>
1. Cost of working up 345½ lbs. of alkaloid in 1872-73 -	2,823	11	9
2. Cost of producing 100 lbs. in 1871-72, at the same proportion - - - - -	812	8	-
3. Interest for two years on plant, buildings, &c. (cost 18,706 rupees), at 6 per cent. (about) - - -	2,200	-	-
4. Moiety of salary of skilled superintendent - - -	-	-	-
TOTAL - - - <i>Rs.</i>	5,836	3	9

24. In these charges we have purposely omitted debiting to the factory account any portion of Mr. Broughton's salary. Our reasons for so doing are:—(1) that the factory has been only experimental; (2) that it has never been worked up to the estimated strength; and (3) that, according to Mr. Broughton's views, the process, though requiring trustworthy and vigilant supervision, does not require the attendance of a professional chemist. We may observe, also, that Mr. Broughton's appointment as Quinologist, and the salary appertaining to that appointment, have been already determined by Her Majesty's Government on considerations other than those connected with the local preparation of alkaloids for the use of the public service.

25. Omitting, therefore, any reference to the salary of the Government Quinologist, we see that the cost price of the bark consumed in the production of 445½ lbs. of alkaloid was about 2,500*l.*, and that the charges of manufacture brought the total expenditure up to 3,083*l.* 12*s.*, whereas we have seen that the same weight of sulphate of quinine might have been landed in our medical store dépôt, Madras, for 2,895*l.* 10*s.* There has, therefore, been a slight loss in local manufacture, assuming that the mixed alkaloids have represented a consumption of an equal weight of sulphate of quinine. The results for 1873-74 will show a rather higher loss than this calculation gives.

26. But as, in point of fact, the mixed alkaloids produced in the local factory consist of chinchonidine, chinchonine, and quinine in varying amounts, combined with resin and uncrystallisable alkaloids, it is obvious that, in a commercial sense, an equal weight of this preparation is not of identical value with sulphate of quinine, which contains about 73 per cent. of the alkaloid "quinine."

27. If we compare the outturn of alkaloids with the prices at present charged for sulphates of chinchonidine and chinchonine, the disadvantage of local manufacture will be still more apparent. Mr. Howard's recent price-list quotes sulphate of chinchonidine at 40*s.* per lb., and, at this rate, assuming the drug to cost 50*s.* per lb., landed in Madras, 1,233 lbs. might have been bought for the sum which we calculate Government has expended in producing 445½ lbs. of mixed alkaloids. Or, if we look to the price of the cheaper salt, sulphate of chinchonine, quoted at 24*s.* per lb., and assume its value, landed in Madras, at 30*s.*, we see that Government might have purchased 2,055 lbs. of this preparation for the same sum that 445½ lbs. of mixed amorphous alkaloids has cost.

28. The Secretary of State for India has expressed surprise that the cheaper alkaloids should be so little in demand in India, considering the high testimony to their therapeutical value borne by the Chinchona Commission, but the explanation is a very simple one. When the therapeutical value of these alkaloids had been established by the labours of the Chinchona Commission in 1868, indents were made on the Home Government for supplies of these drugs; but the prices charged in the case of chinchonidine and quinine were actually higher than the current rates for sulphate of quinine; and when the

fact_g

The price of sulphate of quinine, according to the latest quotations, was somewhat in excess of this figure.

(Initialled) *W. R. C.*

facts were brought to the notice of the head of the medical department, he, in the interests of Government, declined to send requisitions for the alkaloids which were not so well known or established in reputation as quinine. The prices of the several alkaloids, in 1868, are quoted in the margin, on the authority of the Medical Examiner of Accounts; and it will be seen that no advantage could accrue to Government, except in the case of chinchonine, from purchasing the alkaloids, which, it was hoped, would prove cheap substitutes for quinine.

Sulphate of quinine	-	per lb.	Rs 32
" quinidine	-	"	40
" chinchonidine	-	"	40
" chinchonine	-	"	12

29. The sudden raising of the prices of chinchona alkaloids had the effect of completely arresting the demand for them by Indian medical officers, especially considering the cheapness of quinine at that period, and the manufacturers are themselves to blame for this result. Had they been content to keep the prices of hitherto unsaleable commodities in due proportion to the cost of quinine, there would have been a steady and continuous demand from India for the cheaper alkaloids; but they appear to have gone on the principle of "killing the goose that laid the golden eggs," and they succeeded temporarily in arresting the use of these medicines by putting prohibitive prices upon them. Subsequently, however, the manufacturers have seen fit to diminish the price of sulphate of chinchonidine by 100 per cent. of the charge made in 1868, so that if the price remains at about the present quotations of 40s. per lb., there is reason to suppose that the Indian Government might very largely avail itself of this cheap and efficacious alkaloid, in substitution of the more expensive sulphate of quinine.

30. The difficulty in assigning any commercial value to the amorphous alkaloids produced on the Nilgiri estates lies in the fact (1) of their uncertain composition, and (2) the varying proportions of quinine, chinchonidine, and chinchonine contained in them. From some specimens Mr. Broughton has obtained 45 per cent. of mixed crystalline sulphates of quinine and chinchonidine, while other specimens have yielded from 60 to 70 per cent. of crystalline sulphates. If we assume that the rough impure amorphous alkaloids contain, on the average, in five parts, one of crystallisable quinine, two of chinchonidine, one of chinchonine, and one of uncrystallisable residue, we should have, in 445 lbs. of mixed alkaloids, as follows:—

	£.	s.	d.
89 lbs. quinine, reckoned as sulphate (about 117 lbs.), at 130s.	760	10	-
89 lbs. chinchonine (117 lbs. sulphate), at 30s.	133	10	-
178 lbs. chinchonidine, or 243 lbs. of sulphate, at 50s.	589	10	-
89 lbs. of uncrystallisable residue (nominal value)	-	-	-
Total commercial Value	£. 1,483	10	-

31. The commercial value of the mixed alkaloids, therefore, even assuming the most favourable calculations of their proportions and quantities, is seen to be less than one-half the value of the raw material and manufacturing charges, the value being less than 1,500L., and the cost rather above 3,000L.

32. Mr. Howard holds out hopes that the sulphate of chinchonidine—an alkaloid which is very largely produced in the red barks grown in India—may in time be produced so as to sell in this country for one rupee per ounce. We have no doubt that a medicine of known and certain composition such as this is, resembling sulphate of quinine in taste, form, and appearance, would be preferred by the majority of practitioners to the amorphous alkaloids, which are always varying in composition, and which have no physical resemblance to the ordinary quinine-salts. We have already shown that, according to present prices of raw material, the Government can purchase nearly three times the amount of this salt for the cost of the same amount of rough mixed alkaloids; and while the price of chinchonidine remains low, according to the latest quotations, it is abundantly clear that Government cannot continue to manufacture locally at a profit.

33. In this inference, from the facts before us, we must not overlook the difficulties that have been surmounted by Mr. Broughton in the preparation of the active febrifuge alkaloids of the bark. His original instructions were, that he should, "through his investigations, enable Her Majesty's Government to arrive at a decision with respect to the cheapest and best method of preparing the febrifuge for use among the labouring classes of the natives of India, and for the use of hospitals and troops in India."

34. In his letter, dated 1st December 1873, Mr. Broughton has entered most fully into the details of his process of manufacture of the amorphous alkaloids: We need not repeat the details of procedure in this place. It is sufficient to record that the manufacture is so conducted that no single process in it admits of simplification. The process has been designed throughout to suit the circumstances of the country, where the appliances are necessarily rude and the labour unskilled. With a more perfect laboratory, machinery, and modern appliances, it is admitted that better results might have been attained, but at a cost scarcely commensurate with the outlay. Mr. Broughton's arrangements for the alcoholic extraction of alkaloid from the lime-precipitate are especially deserving of notice, for

for their simplicity, ingenuity, and efficiency. Samples of the exhausted lime-precipitate were tested, and found to be absolutely free from alkaloid. The waste of alcohol is theoretically nil, and practically no more than 3 per cent.

35. But, notwithstanding the obvious care and studied simplicity in the appliances used for the extraction of alkaloids, Mr. Broughton records, in his experience of the year 1872-73, that whereas he estimated by analysis of samples that the bark supplied to him in that year would have yielded 538 lbs. of mixed amorphous alkaloids, the actual yield was only 345½ lbs., or 35·6 per cent. below the estimated amount; in other words, more than one-third of the total alkaloids contained in the bark were lost in the process of extraction. All manufacturers are practically aware of the difficulty of obtaining, on a large scale, the same results as a small experimental analysis in the laboratory affords; but the loss of more than one-third of the total alkaloids appears to us to be much too high for profitable working. Owing to the reticence of commercial manufacturers of quinine on all subjects connected with the secrets of their trade, it is not practicable to state what the ordinary loss of alkaloid is, but there can be no doubt that there is an appreciable loss under the most favourable circumstances of manufacture.

36. The loss of alkaloid occurs in various ways. In the first place, from examination of specimens of exhausted bark, it is certain that the whole of the alkaloid is not extracted in the various boilings. A specimen of spent bark examined for us by Mr. Broughton yielded 0·08 per cent. of alkaloid. Then, again, there is a slight loss in the lime-precipitation, as the alkaloids are sparingly soluble in limewater. In grinding the lime-precipitate and amorphous alkaloids, as finally precipitated after their extraction by alcohol, there is a further loss; but probably the greater portion of the loss occurs from the carelessness of the coolies in spilling the fresh bark, decoctions, precipitates, &c. Much of the loss is preventible, as we may briefly indicate.

(a.) Mr. Broughton has always dwelt upon the advantages of operating upon green bark, as it is said to part more readily with its alkaloids. The European manufacturers, however, have necessarily to operate on dried bark, which is reduced to a powder. In the Neddivuttum factory the bark is put into the boilers, just as received from the estate, in long strips, without any preliminary crushing. In practice, it is found that a small portion of the alkaloid remains unextracted after four or five boilings in dilute acid. It seems to us that, if fresh bark be used, it should be torn up or crushed by passing it through rollers with cog-teeth, so as to lacerate the cellular tissue of the bark, and thus allow the acid to penetrate it more freely. If this were done, it seems probable that more alkaloid would be extracted with fewer boilings, and with a smaller consumption of fuel.

(b.) The mechanical arrangements for pressing the bark, and separating the dissolved alkaloids from it, appear to us to be imperfect, and capable of improvement. An apparatus, something on the principle of the cider press, as used in the West of England, would probably be more effectual in squeezing the bark dry.

(c.) In the arrangements for dissolving the alkaloids by alcoholic percolation from the lime-precipitate, there is unnecessary waste of heat. Each percolator is now fed by a separate fire, whereas by a system of flues one or two fires would supply heat for the whole number. Mr. Broughton alludes to the cost of fuel, and the difficulty of procuring wood, but a re-arrangement of the heating apparatus would economise fuel and lessen expense on this account.

(d.) Suitably constructed mills for grinding the lime-precipitate and amorphous alkaloid would lessen waste. At present the common domestic grain-mill is used, and a good deal of the finer particles of lime-precipitate and of the finally precipitated alkaloids fly off as dust, which cannot be re-collected.

37. The various improvements suggested would cost money in the way of machinery and skilled labour, and it is questionable how far the increased yield of alkaloid would compensate for the outlay; but the experience of European manufacturers of alkaloids seems to be in favour of great nicety of manipulation, aided by all the resources that modern mechanical and chemical science can afford.

38. In recording the present failure to manipulate our chinchona barks locally at a profit, we must point out that Mr. Broughton has never been in the position that a commercial manufacturer would have been in, had he undertaken the local production of alkaloids. Mr. Broughton has had no control over the quantity and quality of the bark brought to the factory. He has had to work with small or large prunings, trunk bark, bark of sickly or decayed trees, just as it has been convenient for the superintendent of the plantations, exercising a due regard for the conservancy of the estates, to supply. In the early years of the plantations it is a necessary consequence that much of the bark should be young, and of little value for manufacture. We are informed, however, that by working the plantations on the mossaing system, the proportion of trunk bark available will very much exceed the amount of inferior prunings, and that in future there will be no difficulty in supplying the factory with bark of a quality that is ordinarily used in European manufactories. The yield of alkaloid from green bark, in the four years

of manufacture, has increased from 12 per cent. to 43, or nearly fourfold. This increase of yield is probably due in part to better quality of bark supplied, and probably in part, also, to the more effectual methods of extracting the alkaloids. Mr. Broughton has further had the disadvantage of being obliged to work up green bark at certain seasons of the year only, and of working chiefly with the one species of bark (*succirubra*), which the commercial manufacturers all allow to be the most difficult to work.

39. A commercial manufacturer, on the other hand, would always exercise the privilege of selecting his bark, using only such qualities as experience and analysis would indicate to yield a profitable result. He would distribute his operations so as to give employment to his factory establishment throughout the year, and by these and other measures he would seek to reduce the cost of production to a minimum. As a matter of fact, the laboratory establishment at Neddivuttum has never been worked up to its full power, partly owing to the inferior quality of the prunings supplied, which give all the labour and expense attending the manipulation of the best barks, but with one-fourth or less results, and partly owing to the inability of the plantations, in their immature condition, to supply enough bark to work up 800 lbs. of alkaloid annually.

40. The manufacture of chinchona alkaloids for the whole civilised world is a monopoly in the hands of about a dozen European firms. It is but reasonable to suppose that years of practice in this particular business have given rise to improvements in method of procedure, which, to a large extent, determine the question of profit or loss. It is understood that the methods of working in quinine factories are secrets guarded with jealous care. In the instance of one eminent British firm, we are informed that the partners are under agreement never to admit a stranger to witness the process of manufacture. Mr. H. J. Howard states that "the apparatus used is costly, and the staff highly paid;" but this is the extent of the information he affords on the subject of manufacture. It is understood that the plant and machinery of the Messrs. Howard have cost upwards of 100,000*l.*, and it must be obvious that, with their great facilities for making the most of the bark they use, the rude and simple appliances of our local factory cannot possibly compete.

41. Mr. Broughton's method of working, however, has been published to the world in all its details. His experimental manufacture has been initiated and pursued under many disadvantages peculiar to India. There has been no costly apparatus or highly-trained staff, and the processes he has indicated may be pursued by almost any person of moderate intelligence after a few weeks of training. The principal items of cost are the salaries of the superintendent and coolies. All the ingredients used in the factory, with the exception of sulphuric acid and caustic soda, are obtained in the country, and the cost of acid, soda, and alcohol seems to be small in comparison with the work done. The one great disadvantage in local manufacture, according to past experience, is the considerable waste (amounting to more than one-third) of alkaloids known to be present in the barks. Further experience and improved appliances will tend to diminish waste of alkaloid, so that in time the theoretical and practical yields will probably more closely approximate. Considering all the difficulties of manufacture in this country, we do not think the results have been altogether unsatisfactory, though, as we have already shown, the experiment has not been a commercial success.

42. From the report on manufacture of alkaloids in Java (in G. O., No. 55, of 14th January 1874), under the direction of Mr. Moens, the quinologist of the Dutch Government, it is important to note that similar results to our own have been recorded. It is stated that "the weight of alkaloid obtained each time was not in proportion to the real bulk of the bark experimented upon;" and, further, "we have not up to the present time been able to declare that there was any profit in local manipulation of chinchona refuse, and it is very doubtful whether we could work out good chinchona bark with profit, as it has up to the present commanded such high prices in Europe that, taking labour and expense of manipulating into account, we could not possibly produce more value in alkaloids. Without an extensive and complete establishment, the fabrication of alkaloids will certainly remain costly and defective, and this is the opinion also of Dr. Jobst, the great quinine manufacturer of Stuttgart. French manufacturers also have tried without success to prepare alkaloids in America, at places producing chinchona, with profit."

43. The circumstances attending the French experiment in South America are not accurately known to us; but we understand that Messrs. Delondre, the great French manufacturers of quinine, some years ago sent out skilled assistants and *all needful appliances* to work up bark in the country. The experiment was not successful, but we have no data before us explaining the causes of failure. In Java the result of attempts to work up inferior barks was so unsatisfactory that the manufacturing operations have been discontinued, partly, however, because the eight plantations are so distant from each other, that eight separate factory establishments would be necessary to work up the fresh barks.

44. The Java reporter, however, adds, with reference to the manufacture of alkaloids from the *C. succirubra*: "Rough mixed alkaloids will be much more easily prepared in mass in India than here, not only because the *succirubra* produces a large quantity of that article,

article, but also because, up to the present time, this bark is the least inquired after in the European market." From this report we learn that the authorities in Java are giving their attention to the cultivation of a species of *C. calisaya*, "which produces regularly from 5 to 10 per cent. of pure quinine, which is also easily and perfectly separated;" and that they are not cultivating on a large scale species of barks whose chief yield is the commercially inferior alkaloids of chinchonidine and chinchonine.

45. In considering the question of continuing the local production of rough alkaloids in this country, we have to take into account the fact that the Government plantations on the Nilgiris alone contain upwards of half-a-million of trees of the red bark species, which are valuable, not so much for their quinine-yielding properties, as for their rapid production of a bark yielding large per-centages of other alkaloids. While the present prices of bark are maintained, we do not think that the inferior alkaloids can be possibly produced in India at a profit; but all experts in such matters agree in thinking that present prices cannot be maintained when the supply of crown and calisaya barks from India and Java is sufficient in quantity to influence the home market. These barks, according to Mr. Howard and the Dutch authorities in Java, must, in future years, be the chief sources of quinine. It must, therefore, remain an open question whether the manipulation of the red barks should be conducted in India, or by home manufacturers on Government account. If, on account of the present high value of these barks in the home market, Government may see fit to suspend manufacturing operations in India, no harm will be done. Operations can be resumed whenever the prices of the raw material fall sufficiently to discourage exportation and to make local manufacture expedient; and in the consideration of this question there is a point of some importance, bearing upon the cost of bark for exportation. Mr. Broughton has in use all the buildings at Neddivuttum, except a thatched shed, and unless these can be placed at the disposal of Mr. McIvor for drying purposes, which Mr. Broughton says it is impossible to do so long as his process is at work, other buildings for drying must be raised at a considerable cost.

46. The next subject before us is the medicinal value of the rough mixed alkaloids, as supplied by Mr. Broughton to the Medical Store Department.

47. Carefully recorded trials of this preparation were made in 1869, and the results published in the "Madras Medical Journal" by Mr. Cornish. These results were almost wholly favourable to the use of the mixed alkaloids. The experiments were conducted especially in localities which were noted for their fever-generating qualities. Again, in his letter, No. 189, of 28th April 1874, Surgeon General Balfour gives the results of 1,882 cases of periodical fevers treated by the amorphous alkaloids in the Wynaad, Upper Godavery, &c., and the conclusion he has come to is "that amorphous chinchona alkaloids are a sure febrifuge, but little inferior to the European chinchona alkaloids," and that if the preparation supplied by Mr. Broughton "can be sold at one rupee per ounce, or a cheaper rate, it is extremely desirable that it should be manufactured in larger quantities." (Unfortunately, there is no hope, while prices of bark continue as they are now, that the alkaloids could be profitably sold at one rupee per ounce, the actual cost of production in 1872-73 being nearly four rupees per ounce).

48. In our opinion there can be no reasonable doubt, apart from all prejudice and preconceived opinions, that the amorphous alkaloids, which contain all the active febrifuge principles present in chinchona-barks, are efficacious and useful in hospital and dispensary practice, quite equal, in the great majority of cases, to the purified chinchona-salts supplied to us by home manufacturers; but for many reasons we believe their chief employment must be limited to public hospitals and charities, and that the preparation is one that will take a long time before the native public will estimate at its true value.

49. The preparation is sent into our store depôts in the form of a yellowish-buff or brown powder, in no way resembling the quinine-salts of commerce. It differs also in taste and in ready solubility, and although these are minor objections to the use of a cheap febrifuge (if one can be prepared) in hospitals or public institutions, they are objections of a nature to interfere very seriously with the popularity of the remedy amongst the native public who buy for themselves.

50. In the judgment of the medical profession the great objections to the use of the mixed alkaloids will be the uncertain composition of the mixture. If, for instance, the bark used in the manufacture is rich in quinine, the amorphous alkaloids will consist chiefly of it; but if chinchonidine or chinchonine predominate, then the mixture will partake most largely of the qualities of those alkaloids. There is no stability in the preparation, because the barks sent into the factory are constantly varying in their alkaloidal value. This might, to some extent, be obviated by working regularly with the better quality of the red trunk bark, in which the proportions of alkaloid are more constant; but the objection as it stands is not a mere fanciful one. A specimen of crystalline sulphates in Mr. Broughton's laboratory, when tested for quinine, showed that alkaloid to be entirely absent. Other specimens of amorphous alkaloid showed quinine to be present in fair amount; but it is obvious that a preparation which is constantly varying in regard to the relative proportions of the several alkaloids is not of a character to inspire confidence on the part of prescribers. Medical officers in India, as a rule, do not question the therapeutical value of the chinchona alkaloids allied to

quinine; but they have a preference for knowing the exact composition of any mixture of the alkaloids.

51. And as regards the native public, for whose special benefit a cheap form of febrifuge is desiderated, we must bear in mind the fact that sulphate of quinine is a medicine which is known and finds a sale in every bazaar in the country. The people have every confidence in the crystalline salts of quinine; but it seems extremely unlikely, with their fancies and prejudices, that the brown-looking powder of the rough mixed alkaloids will ever be regarded as identical with the quinine of which they have had experience.

Fancies and tastes are all-powerful in regard to therapeutical preparations, and when the native public are concerned these fancies and tastes cannot be overlooked.

52. The name given to the mixed alkaloids by the late head of the Medical Department, Dr. W. McKenzie, C.B., has been objected to in the public papers, and with some show of reason. The term "amorphous quinine" might have led some persons unacquainted with the nature of the preparation to suppose that the mixture consisted entirely of quinine in an amorphous state. But in regard to the actual nature of the preparation there has been no disguise or concealment. The term "amorphous chinchona alkaloids" would, no doubt, have more correctly described its composition, though it would not be so readily understood by the natives of India.

53. Government are probably aware that the alkaloid "quinine" was discovered only in the year 1820, and that for 150 years prior to this date the chinchona barks in their natural state were employed in Europe for the cure of fever. In 1845 the alkaloid "chinchonidine" was discovered, and in 1849 "quinidine." Up to the years 1853 or 1854, all the sulphates of quinine of commerce consisted of the mixed alkaloids, just as they existed in the various barks. The tests now employed to ascertain the purity of quinine only came into use on the publication of a new British Pharmacopœia in 1854. The framers of the Pharmacopœia at this period had no experience of the therapeutical qualities of the alkaloids quinidine, chinchonidine, and chinchonine; and they adopted tests for the quinine of commerce which virtually compelled the manufacturers to separate them at great labour and expense, and with the result of enormous waste of febrifuge material. This action of the framers of the Pharmacopœia has tended more than anything else to the maintenance of high prices of quinine, because the manufacturers have had thrown back upon their hands enormous quantities of alkaloids (almost identical in chemical constitution and behaviour with quinine), which, being repudiated as unauthorised or unsanctioned by the Pharmacopœia, become, in a great measure, unsaleable to the medical profession.

54. It will scarcely be credited that the last edition of the British Pharmacopœia (1867), while giving a wholly impracticable formula for the manufacture of sulphate of quinine, and tests to ascertain the purity of that salt and its freedom from the other alkaloids, is altogether silent in regard to the mode of preparation or uses of quinidine, chinchonidine, or chinchonine. The medical profession, in fact, to this day have no authority or sanction to employ these alkaloids. But since the official issue of the last edition of the British Pharmacopœia, there has been accumulated in India such a mass of evidence bearing on the question of the therapeutical value of these alkaloids that their official admission into the authorised code of remedial agents is merely a question of time. Already, according to Mr. Howard, the salts of chinchonidine are making their way in the estimation of the profession, and especially for hospital use, and, being only half the price of quinine, are in demand. We understand, moreover, that a large foreign firm intend, in future, to manufacture mixed sulphates of chinchona alkaloids in the proportion in which they exist in bark; and we have no doubt that the more clearly this question of the therapeutical value of the mixed alkaloids is understood by the medical profession, the sooner will they demand to be supplied with the febrifuge alkaloids in the proportion that they have been combined in the barks by nature, and the more determinedly will they risk the pedantic efforts of the compilers of the Pharmacopœia to deprive them of a plentiful supply of one of the most valuable febrifuges the world has ever produced.

55. The evil of this attempt to separate the associated alkaloids from quinine is not so apparant in countries where the tests for quinine are well understood; but it has had the effect of throwing upon manufacturers' hands a great quantity of alkaloid that is practically unsaleable, and therefore unused. Honest manufacturers, who know the worth of these alkaloids, call them by their proper names, and endeavour to induce medical men to pronounce dispassionately on their merits; but there are other producers not so scrupulous, and the foreign markets of India and China are occasionally flooded with something that professes to be "quinie sulphas," but which, in some cases, is a salt of chinchonine, and in others no chinchona alkaloid at all. Only a few months ago a medical man in Madras made a public complaint that, having prescribed quinine for a patient, he found that the mixture dispensed on his prescription by one of the best druggists in the town contained no quinine, and that the druggist's stock of "quinine" consisted entirely of a salt of "chinchonine."

56. Indian experience has sufficiently demonstrated that there is nothing in the therapeutical or physiological action of the various chinchona alkaloids to justify the framers of the

the British Pharmacopœia in insisting upon the separation of quinine, and its preparation in a condition of purity. By this grave error, during the past twenty years the consumption of quinine has been limited, while thousands of pounds of associated alkaloids, equally valuable in a remedial sense, have been wasted, and the world at large has suffered, and none but a few unscrupulous manufacturers and dealers have benefited by the waste. The whole of the Indian evidence on the use of the associated alkaloids should be officially laid before the Royal College of Physicians of London, with a request that the influence of that august body may be brought to bear to obtain a recognition of mixed chinchona alkaloids as a pharmacopœial preparation. These several chinchona alkaloids may be isolated as chemical curiosities; but for real practical therapeutics, the experience of the profession from the year 1820 to 1854, and the Indian experience of the value of the separated alkaloids, all testify that the labour and expense incurred in such separation is unnecessary, and only calculated to keep up the prices of remedies which the philanthropist would desire to cheapen for the benefit of the whole human race.

57. While, therefore, in the public service of this country there is no necessity to incur expense in the isolation of chinchona alkaloids, it must be borne in mind that the public (apart from the medical profession) have become so accustomed to the use of crystalline preparations of chinchona alkaloid that it would be a work of time to popularise a preparation of them which stops short of the crystalline form.

58. In our opinion, if local manufacture is to be carried on at all, an attempt should be made to obtain crystalline salts of chinchona alkaloids. For the public service these salts need not be "bleached," as the commercial manufacturers issue them; but we are certain that the medical officers of the Government establishments would prefer to use mixed sulphates to the present amorphous powder. Any uncrystallisable residue in this manufacture might be usefully employed in hospital practice for the treatment of mild fevers, or as a tonic. Mr. Broughton is doubtful whether the preparation of the mixed sulphates could be economically conducted in this country. He would require some addition to his manufacturing plant, and in regard to this question, generally, he will be requested to state his views for the information of Government. We are of opinion that, if it be determined to try experimentally the production of mixed crystalline salts of chinchona alkaloids, the inferior bark suited only to druggists' use should not be worked, but that the factory should be supplied with the best quality of red bark for this object.

59. The manufacturing operations during 1873-74 have not been so satisfactory as in the former year. The amorphous alkaloids, when sent into the medical stores, were found to cake and run into a sticky mass, so that it could not be utilised, except by solution in an acid. The cause, Mr. Broughton explains, was an error in manufacture. To obviate waste of alkaloid, he adopted the plan of concentrating the bark-decoctions to one-sixth of their bulk before adding lime to precipitate the alkaloid. In this process of concentration the decoctions were boiled in the copper boilers, and, as the fluid evaporated, some portions of alkaloid caked or collected at the bottom of the boiler, and became overheated, and changed in its constitution so as to become uncrystallisable. The error has been rectified by stopping the concentration of the fluids at one-third of their original bulk, but much of the product of the year 1873-74 has been changed in form, and Mr. Broughton has proposed to issue the quantity thus deteriorated in solution. As, however, this mode of dealing with the product would most likely shake the confidence of medical officers in the value of amorphous alkaloids, the Sanitary Commissioner suggests that Mr. Broughton had better be instructed to recover all the crystalline alkaloid he can get from the mass now in the factory, and issue it as "unbleached sulphate," rather than attempt to induce medical officers to use it in solution. Some loss is unavoidable, but as it seems probable that the concentrated solution proposed by Mr. Broughton would remain to ornament provincial dispensary shelves, we think it more to the advantage of the public service that the product should be sent out in such a form that medical men will have no hesitation in using it.

60. We have now expressed our views in regard to the two questions submitted for our opinion; but before concluding this report it is necessary that we should refer to the original estimates of the cost of local production of alkaloids, to show how the Government has been led to believe that a cheap alkaloidal febrifuge for the people of this country was possible.

61. In Government Order, No. 249, of 7th February 1871, Mr. Broughton gave estimates of the yearly expenses for the local production of 800 lbs. of mixed alkaloids, and the information then afforded led Government to believe that the rough mixed alkaloids could be produced for about one rupee per ounce. On referring to this estimate, however, we find that Mr. Broughton, as far as his actual results are concerned, has been quite within the limits of cost there assigned, except in regard to one important particular, *i.e.*, the value of the bark.

62. With regard to the value of the bark, Mr. Broughton stated: "I am informed by Mr. McIvor that the cost *on the spot* of red bark will range from 4 *d.* to 6 *d.* a lb. I adopt the higher price in the estimate, and reckon its mean yield at the low one of 4 per cent." With these data Mr. Broughton estimated that one pound of alkaloid

might be produced for Rs. 14. 6. 7, or, adding 5 per cent. on cost of plant, for about 16 rupees a lb.

63. We have examined Mr. McIvor, with a view of learning how he arrived at the opinion that dry bark delivered on the spot would only cost Government from 4 *d.* to 6 *d.* per lb. He explains that his estimate of cost of production had reference only to the expenses of cultivation and collection; that he did not take into account the original outlay incurred by Government in planting the estates; and that he is not prepared to state what the actual cost of production is, including every source of outlay. It is clear, therefore, that the original estimate on which Government hoped to be able to manufacture a cheap febrifuge was an erroneous one.

64. It will be observed that instead of debiting the factory with 6 *d.* per lb. all round for bark supplied, we have adopted that rate only for inferior branch bark, and have charged the present net value of 2 *s.* for the trunk-bark. This, in regard to about three-fourths of the outturn of alkaloid, shows a ratio of 300 per cent. for raw material above the price originally estimated. The average yield of the bark supplied was also less than the estimated 4 per cent. Under these circumstances, it is sufficiently obvious why the actual cost of the alkaloid should be nearer four rupees than one rupee per ounce.

65. The views expressed by the Secretary of State have throughout been clear and consistent in regard to the Government experiment of chinchona culture—*i. e.*, that it was not to be regarded as a mere mercantile venture, but that the more important result of affording an abundant supply of febrifuge for Her Majesty's Indian subjects was to be considered paramount. Later expressions of opinion of the local Government would seem to indicate that the commercial aspects of the experiment are regarded as of primary importance.

66. Combinations of business and philanthropy are rarely successful, and, in regard to the supply of a cheap febrifuge to the people of India, this can only be possible when the raw material for alkaloid manufacture shall be so abundantly produced as to diminish its commercial value. The question of local manufacture of alkaloids is one of no permanent importance, because, so long as barks yield high prices, the more-economical processes and better appliances of home manufacturers will enable them to compete successfully with local manufacturers. The value of raw material in the open market must always determine the cost of chinchona alkaloids.

67. There is one subject beyond the limits of our instructions on which we desire to offer a few remarks. In the course of our examination of the Government plantations at Neddivuttum we were much struck with the robust growth, as compared with established species of the same age, and exposed to similar conditions of soil and climate, of certain seedlings resulting from hybridisation. Plants, such as we describe in a young plantation of *C. succirubra*, had attained double the height and lateral expansion of the young red barks, and gave every indication of robust health and great vigour of constitution. The hybridisation of the several species of chinchona is, perhaps, the most interesting and promising feature in connection with this great experiment. In their native country it is well known the various species of chinchona flourish in different localities hundreds or even thousands of miles apart, where the opportunities of cross-fertilisation of the flowers are rare or wanting. But in the Government plantations we have growing side by side the grey barks of Peru, the crown barks of Condaminea, the Calisayas of Bolivia, and the red barks of Loxa, and the result is now seen in the different habits and characteristics of the seedling plants raised on the estates.

68. The fact of the readiness of the various species of chinchona to receive fertilisation from a neighbouring plant is now abundantly proved, and we would desire to offer a few suggestions for consideration, showing how this natural peculiarity of the plant may be utilised in the artificial production of new varieties that shall be superior to anything we at present possess in perfect adaptation to our soil and climate and in alkaloid-yielding properties. The field of inquiry we refer to is one of vast proportions, and will require to be pursued patiently perhaps for many years to come; but anyone acquainted with the results of scientific horticulture as applied to the specific improvement of particular plants must be well aware that the judicious crossing and selection of the various species offers the greatest promise of eventual success, and that by patiently following this path Government may be enabled to produce a chinchona plant that shall be perfectly fitted to supply the population with the greatest quantity of febrifuge in the least possible lapse of time.

69. Mr. McIvor some years ago showed the importance of this phenomenon of hybridisation, and indicated the direction in which it might lead. Mr. Broughton also, in his contribution to the Linnæan Society, has shown that the chinchona are dimorphous, and are preferentially impregnated from separate trees. We now learn from Mr. McIvor that he has raised seedlings from artificially-fertilised seeds, and that he has crossed the Calisayas with robust hybrid species. The extraordinary yield of alkaloid of the *C. Angustifolia Pubescens* and some other varieties of seedlings show the direction in which the future experimental culture of the Government may be profitably turned. But we would advise

advise that the whole question of artificial hybridisation of promising species should be carefully worked out by the Superintendent and Quinologist in intimate communication.

70. Every distinct variety of plant should be noted by the Superintendent, and examined in different stages of its growth by the Quinologist, and the results recorded; and a careful public record should also be kept of every experiment in cross-fertilisation. The original instructions of the Secretary of State that the superintendent of the plantations and the Government Quinologist should work together in intimate communication cannot be too strongly insisted upon, as regards all the great scientific questions connected with the improvement of the chinchonæ for yield of alkaloid. We regret to observe that there is not at present that cordiality and harmony in the working of these public officials (both eminent in their several spheres) which we think conducive to the best interests of Government; and we notice the subject simply because we are anxious that these gentlemen should, in the interests of the State, unite to shed new lustre on their scientific reputations by a patient and thorough investigation of the qualities of artificially or naturally produced new varieties of the febrifuge-yielding plants.

71. In conclusion, we may briefly summarise the main results of our inquiry:—

(1.) The cost-price of mixed alkaloid issued by Mr. Broughton for use in the Medical Department, compared with current prices of bark, is somewhat in excess of the present price of sulphate of quinine, more than double the cost of sulphate of chinchonidine, and rather more than four times the cost of sulphate of chinchonine. The calculations do not include any portion of the salary of the Government Quinologist.

(2.) The original estimates on which Government commenced manufacturing operations were fallacious as regards the value of the raw material used. The cost to Government of dry bark was assumed at 6 *d.* per lb. without any foundation in fact.

(3.) The results of manufacture show a progressive improvement in yield of alkaloid up to the end of 1872-73. (The results for 1873-74 have, to some extent, been vitiated by an error in the manufacturing arrangements, since detected and rectified.)

(4.) There is still a considerable difference between the *estimated* and *actual* yield of alkaloids (more than one-third).

(5.) The processes of manufacture are simple, and the appliances rough. Better results may be anticipated with modifications suggested, and by working with a better quality of bark.

(6.) As regards the medicinal value of the amorphous alkaloids, there is ample testimony in favour of their efficacy in curing fevers; but the remedy being in strange and novel form is more adapted for hospitals and public institutions than for sale to the native public, who are already familiar with the properties and appearance of quinine-salts manufactured in Europe.

(7.) The manufacture, it is suggested, should be carried one stage further (to the production of crystalline sulphates), if it is thought desirable in the present condition of the bark market to continue local operations.

(8.) The hybridisation of species of chinchona is a phenomenon that brings us to the threshold of a new department of inquiry and research, which might be profitably entered upon by the scientific officers entrusted by Government with the progress of the experimental culture of the chinchonas.

(9.) The cordial co-operation of these public officials is essential to successful issues.

Enclosure 8, in No. 40.

MINUTE by the Honourable J. D. Sim, C.S.I.

In his letter, dated 14th March last, No. 22, the Commissioner of the Neilgherries drew the attention of Government to the fact that some branch crown-bark, which has been considered not worth working up in the Neilgherry Factory, and which Mr. Broughton had deprecated sending to England as likely to injure the reputation of Neilgherry bark in the home market, had there realised prices ranging from 2 *s.* to 3 *s.* 6 *d.* per pound.

2. This naturally suggested doubts as to the working of the factory; and, as the best means of arriving at a satisfactory conclusion on so important a point, the Government deputed the Sanitary Commissioner, Mr. Cornish, and the Commissioner of the Neilgherries, Mr. Cockerell, to investigate the subject on Mr. Broughton's return from leave, and to report specially on the cost and the medicinal value of the "amorphous quinine" manufactured by that gentleman.

3. The Committee met at Ootacamund last month, visited the factory at Neddivuttum, and examined Mr. Broughton and Mr. McIvor. The result of their inquiries is contained in the report now before us.

4. The committee show clearly that, on the most favourable calculation, we are paying twice as much for our "amorphous quinine" as it is worth. The 445 lbs. manufactured in 1871-72 and 1872-73 cost us about 3,000 £., and are worth 1,500 £. The results of 1873-74 are not given; and in the current year, as we know, a mistake in one of the processes has led to the loss of a considerable quantity.

5. But not only is the cost of manufacture thus excessive, but the article produced is of inferior quality. Of the efficacy of the mixed alkaloids as a febrifuge there can be no doubt, but the drug as prepared and issued is of uncertain composition: sometimes it is rich in quinine, at others chinchonidine and chinchonine predominate. This is obviously a very serious objection, and the form in which the preparation is issued is also inconvenient.

6. Under these circumstances, it is obvious that the manufacture should at once be abandoned. There seems scarcely any reason to expect any material improvement to compensate for the great waste of alkaloids, or to render it desirable for the Government to establish a public manufactory. Similar attempts have failed in Java and America, and the Government may well leave the matter to private agency. Should circumstances hereafter render it desirable to revive the attempt to manufacture, this can easily be done; meanwhile, by closing the experiment a considerable saving will be effected, and new buildings need not be constructed at Neddivuttum, as otherwise they must be, for drying the bark as harvested.

7. Mr. Broughton has now formally resigned his appointment, in terms and on grounds that would have necessitated its acceptance, even if his manufacture had been a success, instead of a failure. Mr. Broughton's qualifications as an analytical chemist are undoubtedly of a high order, but his usefulness as a public officer has been marred by his lack of other necessary qualifications. By the Government he has uniformly been treated with the utmost consideration, and no one can read the report of the Commissioners without seeing that, so far from having any bias against him, the reverse is really the case. Mr. Broughton, however, cannot brook even an honest difference of opinion, or the slightest semblance of authority over him, and I am driven to the conclusion that his usefulness to the Government has ceased.

8. I do not think there is any necessity now for a chemist, certainly not for such a heavy expenditure as Mr. Broughton's employment entails. The whole of our bark will now be sent to the Secretary of State, and samples can be selected at the India Office from each consignment as well as sent from hence, and arrangements might be effected with Mr. Howard and Dr. De Vrij for the analysis of these at considerably less cost than the employment of a chemist in this country will entail, while we shall have the advantage of analysis by two independent individuals. I should deprecate Mr. Broughton having anything to do with our bark, his animus against both commissioner and superintendent being self-evident.

9. Mr. Broughton has been allowed such independence that we do not know what work he has on hand. He should be informed that no further manufacture is to be undertaken, and he should be desired to state what other work he is engaged upon, when it will be finished, and whether he wishes to leave before his six months' notice expires. The factory buildings should all be made over to the commissioner, and the bungalow now occupied by Mr. Broughton should be constituted the residence of the Superintendent of the Government Gardens, whose present dwelling is very inconveniently situated, and needs repair and enlargement.

10. The Commissioner must be instructed to send the whole of the bark to England, with samples, and the fullest information regarding each consignment.

11. We must now ask the Secretary of State to endeavour to arrange with Messrs. Howard or other suitable persons for the manufacture from our *Succirubra* bark of chinchonidine sulphates for use in this country, as suggested by Mr. Howard a short while ago, or, as suggested by Mr. Cornish, a combination of the different alkaloids.

12. We must request the Secretary of State's attention to paragraphs 53-57 of the report.

13. The superintendent of the plantations has paid due attention to the raising of new species by hybridising, and it is in this direction that, in my judgment, any extension of our operations should be carried on. In the annual report special notice should be made of new varieties.

14. The committee properly attach great importance to cordial co-operation between the superintendent of the plantations and the quinologist. The only way to attain this very necessary and desirable object is to restrict each to his own special work; the quinologist should no more be allowed to meddle with purely horticultural matters than the superintendent with the operations of the factory. There was no lack of harmony until Mr. Broughton went out of his way to assail Mr. Melvor on the question of coppicing *versus* mossing.

19 December 1874.

(No. 130.)

MINUTE by His Excellency the Commander in Chief.

THE report by the Commissioner of the Nilgiris and the Sanitary Commissioner on their inquiry into the working of the Neddivuttum Factory, and on the medicinal value of its products is most exhaustive, and places these matters before us in the clearest light.

2. The Hon. J. D. Sim's Minute touches upon every point of interest, and I have nothing to do but to express entire concurrence in the views he expresses.

3. The thanks of Government should, I think, be offered to Mr. Cockerell and Mr. Cornish for their very able and impartial report.

4. As regards Mr. Broughton, we can have no hesitation in accepting the resignation he tenders in such uncourteous terms.

20 December 1874.

(No. 131.)

MINUTE by His Excellency the Governor.

THIS well-considered and exhaustive report shows conclusively that the manufacture of "amorphous quinine" in this Presidency is carried on at a very serious loss to the public revenue; that we might have imported for use in this country an amount, fully equal to that of the "amorphous quinine" which we have manufactured, of an article which is, for all practical purposes, very far superior to it, and at a rather less cost. And this, although the salary of the "quinologist," which is a very serious item in the expense of our manufacture, has been excluded from the estimate of that expense, nor does it appear that there is any prospect, such as can safely be relied upon, of material improvement in this respect. To continue the experiment would, I have little doubt, lead only to a still further waste of public money; and I would order the immediate suspension of the manufacturing operations, the buildings being utilised, and machinery disposed of to the best advantage. Mr. Broughton's resignation must be accepted; and the question must be decided in what manner he is to be replaced. It is evident that, with the suppression of the manufacture, the necessity for the appointment of a highly-paid official will no longer exist; and, for my own part, I should suppose that, for the future, functions, in the nature of those of a "quinologist," are altogether unnecessary. The properties and value of the various barks are now known; and what we have to do for the future is to send the produce of our plantations home for manipulation there in the best condition which may be consistent with remunerative production. The papers must, of course, be sent to the Secretary of State, and, until we receive his instructions, no irrevocable action can be taken in the matter. I trust that the result will be that this branch of commerce into which, setting aside general principles, Government has entered, will be in no further danger of financial failure.

24 December 1874.

(No. 132.)

MINUTE by the Hon. *W. Robinson*, C.S.I.

THE report is exhaustive and conclusive; but I think that these papers should go to the Secretary of State before we finally decide to abandon local manufacture. I see, too, that in Bengal they are about to try local manufacture, and the result of our experiment should be communicated to that Government.

I fear that there is nothing for it but to accept the notice of resignation on the part of Mr. Broughton, but I greatly regret it. At the same time, I do not think that we should be without independent local chemical advice in the matter of the chinchona experiment. Possibly, we might utilise the quinologist of Bengal (Mr. Wood).

2. The thanks of Government are due to the Commissioner and Dr. Cornish.

3. I agree to the arrangement proposed by Mr. Sim in regard to the house in the gardens.

27 December 1874.

ORDER of the Madras Government thereon, 11 February 1875.

IN his letter, dated 14th March last (No. 22), the Commissioner of the Nilgiris drew the attention of Government to the fact that some branch crown bark, which had been considered not worth working up in the Nilgiri Factory, and which Mr. Broughton had deprecated sending to England as likely to injure the reputation of Nilgiri bark in the home market, had there realised prices varying from 2 s. to 3 s. 6 d. per pound.

Government Order,
22nd June 1874,
No. 759, paragraph
15.

2. This naturally suggested doubts as to the working of the factory; and, as the best means of arriving at a satisfactory conclusion on so important a point, the Government deputed the Sanitary Commissioner, Mr. Cornish, and the Commissioners of the Nilgiris, Mr. Cockerell, to investigate the subject on Mr. Broughton's return from leave, and report specially on the cost and medicinal value of the "amorphous quinine" manufactured by that gentleman.

3. The Committee accordingly having met, visited the factory at Neddivuttum, and examined Mr. Broughton and Mr. McIvor, submit the result of their inquiries in the report recorded above.

4. The committee show that, on the most favourable calculation, the Government are paying twice as much for the "amorphous quinine" as it is worth. The 445 lbs. manufactured in 1871-72 and 1872-73 cost about 3,000 L., and are worth 1,500 L. The results of 1873-74 are not given, and in the current year, as explained, a mistake in one of the processes has led to the loss of a considerable quantity.

5. Further, not only is the cost of manufacture thus excessive, but the article produced is of inferior quality. Of the efficacy of the mixed alkaloids as a febrifuge there can be no doubt, but the drug, as prepared and issued, is of uncertain composition. Sometimes it is rich in quinine; at others, chinchonidine and chinchonine predominate. This is obviously a very serious objection, and the form in which the preparation is issued is also inconvenient.

6. Under these circumstances it is obvious that the manufacture should at once be abandoned. There seems scarcely any reason to expect any material improvement to compensate for the great waste of alkaloids, or to render it desirable for the Government to establish a public manufactory. Similar attempts have failed in Java and America. Should circumstances hereafter render it desirable to revive the attempt to manufacture, this can easily be done. Meanwhile, by closing the experiment, a considerable saving will be effected, and new buildings need not be constructed at Neddivuttum for drying the bark as harvested.

7. Mr. Broughton has now formally resigned his appointment, and the question of filling up his place will be referred for the decision of the Secretary of State. The Governor in Council is of opinion that, with the suppression of the manufacture the necessity for the appointment of a highly-paid official will no longer exist; and as the properties and values of the various barks are now known, functions in the nature of those of a "quinologist" may be regarded as unnecessary. The whole of the bark will now be sent to the Secretary of State, and samples can be selected at the India Office from each consignment, as well as sent from hence, and arrangements effected with Mr. Howard and Dr. De Vriz for the analysis of those at considerably less cost than the employment of a chemist in this country will entail. There will also be the advantage of analysis by two independent individuals.

8. Mr. Broughton will be informed that no further manufacture is to be undertaken, and he will be desired to state what other work he is engaged upon, when it will be finished, and whether he wishes to leave before his six months' notice expires. The factory buildings will all eventually be made over to the Commissioner, and the bungalow now occupied by Mr. Broughton constituted the residence of the Superintendent of the Government Gardens, whose present dwelling is very inconveniently situated and needs repair and enlargement.

9. The Commissioner will be instructed, in sending the bark to England, to submit the fullest information regarding each consignment and sample.

10. The Secretary of State will be moved to endeavour to arrange with Messrs. Howard, or other suitable persons, for the manufacture from the Nilgiri succirubra bark of cinchonidine sulphates for use in this country, as suggested by Mr. Howard a short while ago, or, as suggested by Mr. Cornish, a combination of the different alkaloids.

11. The particular attention of the Secretary of State will be drawn to paragraphs 9 and 53-57 of the Report.

12. The superintendent of the plantations has paid due attention to the raising of new species by hybridising; and it is in this direction that any extension of operations should be carried on. In the annual reports special notice should be made of new varieties.

13. The Committee properly attach great importance to cordial co-operation between the superintendent of the plantations and the quinologist; but at present no further orders on this point are necessary. If the appointment of quinologist is revived, the subject will be again noticed.

14. The thanks of Government are due to the Commissioner and Mr. Cornish for their very lucid and valuable report.

15. The Government are not aware to what expressions of opinion the Committee allude to in paragraph 65 of their Report. The object throughout has been to avoid trenching upon the commercial interests involved in the cultivation of chinchona. To prove that such culture could be made profitable, and then to bring the febrifuge within reach of the masses, were the chief objects aimed at.

— No. 41. —

(No. 3—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Marquis,

Fort George, 24 March 1875.

WE have the honour to advise your Lordship of the transmission to the India Office of 278 bales of chinchona bark from the Government Plantations on the Nilgiris, containing in all 28,659½ lbs. nett. Of these, 172 bales were sent by the S.S. *Cathay*, which left this port on the 16th March 1875, and the remaining 106 bales will be forwarded by the S S. *Mahwa*, which leaves on the 29th idem.

2. The papers on the subject, including Mr. McIvor's detailed invoice for the 278 bales and Bill of Lading for the 172 bales sent by the *Cathay*, are herewith forwarded. Proceedings of Government, 24th March 1875.

2. Your Lordship will perceive that the freight is to be paid in England.

We have, &c.

(signed *Hobart, &c.*)

From the Superintendent, Government Chinchona Plantations, to the Acting Commissioner of the Nilgiris, dated Ootacamund, 9th March 1875.

I HAVE the honour to inform you that, with the approval of the Commissioner, I have despatched to Mr. J. H. DeSalis, the Agent of the P. & O. S. N. Company, Madras, 278 bales of chinchona bark, containing 28,659½ lbs. net,* as per details in the invoice enclosed. This bark is consigned to the Secretary of State for India, and will leave Madras by the *Cathay* on the 15th instant. To avoid delay I have asked Mr. DeSalis to forward the Bill of Lading direct to the Secretary to Government, Revenue Department, Madras, for transmission to the Secretary of State for India, and to effect an insurance on the bark for 4,000 *l.* The freight, at the rate of 2 *l.* 5 *s.* per ton of fifty cubic feet, to be paid in England.

	<i>lbs.</i>
Unmossed crown bark	- 12,172
Mossed " "	- 3,480½
Renewed " "	- 100
Unmossed red " "	- 3,790
Mossed " "	- 4,200
Renewed " "	- 4,917
NET	- - - 28,659½

— No. 42. —

REPORT on the Number, Distribution, and condition of Chinchona Plants on the Nilgiris for the Half Year ending 31st January 1875.

No. of Species.	Botanical Names.	Commercial Names.	No. of Plants.	Value per lb. of dry Bark in the London Market.
				<i>s. d. s. d.</i>
1	<i>C. Succirubra</i> - - - -	Red bark - -	1,215,963	2 6 to 8 9
2	<i>C. Calisaya</i> - - - -	Yellow bark - -	54,881	2 1 " 9 -
	<i>C. Calisaya</i> var. <i>Frutex</i> - - -			
	<i>C. Calisaya</i> var. <i>Vera</i> - - -			
3	<i>C. Officinalis</i> - - - -	Original <i>loxa</i> bark -	1,183,159	2 10 " 7 -
	<i>C. Officinalis</i> var. <i>Condemenia</i> -			
	<i>C. Officinalis</i> var. <i>Bonplandiana</i> -			
	<i>C. Officinalis</i> var. <i>Crispa</i> - - -			
4	<i>C. Lanceifolia</i> - - - -	Pitayo bark - -	279	1 8 " 2 10
5	<i>C. Nitida</i> - - - -	Genuine grey bark -	2,786	1 8 " 2 9
6	<i>C. species</i> without name - - -	Fine grey bark - -	8,500	1 8 " 2 10
7	<i>C. Micrantha</i> - - - -	Grey bark - -	46,730	1 8 " 2 9
8	<i>C. Peruviana</i> - - - -	Finest grey bark -	3,389	1 8 " 2 10
9	<i>C. Pahudiana</i> - - - -	Unknown - -	425	Unknown.
10	<i>C. Lanceolata</i> -leaved variety of <i>C. Officinalis</i> .	- - - -	19,885	- ditto.
11	<i>C. Pitayo</i> , raised from imported seeds.	- - - -	26,656	- ditto.
12	<i>C. Pitayo</i> , plants brought out by Dr. Simpson.	- - - -	76	- ditto.
TOTAL Number of Plants - - -			2,654,593	

TABLE showing the Growth of the different Species of Plants planted out in the Plantations for the Half Year ending 31st January 1875.

No. of Plants.	Species.	Where planted.	When planted.	Maximum Growth.	Average Growth.	Height of the Tallest Tree.	Girth near the Ground.
				Inches.	Inches.	Feet.	Inches.
12	<i>C. Succirubra</i>	Neddivuttum	30 Sept. 1862	21	6½	39½	28½
12	<i>C. Micrantha</i>	ditto	ditto	—	—	—	—
12	<i>C. Officinalis</i>	Dodabetta	30 Sept. 1863	5	4	26	18½

TABLE showing the Propagation and Distribution of Plants and Seeds during the Half Year ending 31st January 1875.

D A T E.	Total Number of Plants Propagated.	Total Number of Plants Permanently Planted out.	Total Number of Plants Distributed to Private Individuals.	Total Quantity of Seeds Distributed.
August 1874	1,320	—	1,100	oz. 2
September	780	—	116	1½
October	740	—	—	1½
November	1,460	—	—	—
December	840	—	—	—
January 1875	420	—	—	5½
TOTAL	5,560	—	1,216	11
Previously	2,649,033	1,190,458	234,531	469½
GRAND TOTAL	2,654,593	1,190,458	235,747	480½

REMARKS.

The number of plants propagated during the past half year is 5,560, viz., 4,800 plants of *C. Angustifolia* (var. *Lanceolata*), and 760 of *C. Pitayensis*.

The number of plants permanently planted out in the plantations remains the same as was shown in previous half-yearly report, viz., 1,190,458.

1,216 chinchona plants have been issued to the planters in Wynaad, and 11 oz. of chinchona seed supplied to the public.

4,210 lbs. of chinchona trunk bark, and 81,561 lbs. of branch bark have been supplied to the Government quinologist for the manufacture of amorphous quinine from April 1874 to January 1875.

334½ lbs. of green tea leaf have been supplied to Major Jennings.

The 12 *C. Succirubra* trees in Table II. have been barked, and consequently the measurement of their girth is decreased. The *C. Micrantha* trees were coppiced during the last monsoon.

Ootacamund, 1 March 1875.

— No. 43. —

(No. 10—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Marquis,

Fort St. George, 6 April 1875.

IN reply to the question conveyed in your Lordship's letter, No. 3, of the 28th January 1875, we have the honour to state that the supply of bark used in 1871 was ordered to be obtained by the mossing process, because the Government quinologist, though advocating the superior merits of coppicing, was of opinion that his system could not be put into practice for two years from that time.

2. Detailed experiments are now on foot in view to a final settlement of the merits of the two systems. Pending this, we are of necessity obliged to use the mossing process; for, should the coppicing method prove in the long run the less advantageous, we should, by using it during the tentative period, commit damage which would take much time to set right. The use of the mossing process, if eventually found to be undesirable, will carry with it no such irreparable damage.

We have, &c.

(signed) Hobart, &c.

— No. 44. —

(No. 23—Revenue.)

From the Government of Madras to the Secretary of State for India.

My Lord Marquis,

Ootacamund, 23 July 1875.

ADVERTING to the correspondence marginally noted, relative to two recent consignments of chinchona bark, per steam ships "Cathay" and "Malwa," we have the honour to forward the accompanying Papers,* from which your Lordship will perceive that the freight upon these consignments is 4 *l.* 5 *s.* per ton, not 4 *l.* 10 *s.*, as erroneously stated in the bills of lading.

Secretary of State, 24th March 1875, No. 8, Miscellaneous.

To Under Secretary of State, 2nd April 1875, No. 18.

* Proceedings of Government, 20th April 1875.

Proceedings of Government, 6th July 1875.

We have, &c.

(signed) *W. Robinson, &c.*

Enclosure in No. 44.

From the Commissioner of the Nilgiris to the Secretary to Government, Revenue Department, Fort St. George, dated Ootacamund, 13th April 1875.

IN the letter of Mr. M'Ivor in Government Order, Revenue Department, 24th March 1875, No. 480, on the subject of chinchona bark, announcing the Despatch to the Secretary of State for India of certain chinchona bark, it is stated that the freight is 2 *l.* 5 *s.* per ton, which is an error; the sum is 4 *l.* 5 *s.* per ton of 50 cubic feet.

ORDER of the Madras Government thereon, 20th April 1875.

IT is observed that the two bills of lading for the consignment of chinchona bark in question, received from the agent of the Peninsular and Oriental Steam Navigation Company, give the freight as 4 *l.* 10 *s.* per 50 cubic feet, not 4 *l.* 5 *s.*, as stated in the foregoing letter. These documents will now be forwarded to the Commissioner of the Nilgiris, with the request that he will be good enough to return them at an early date, with any remarks he and Mr. M'Ivor may have to offer, in respect to the amounts entered therein on account of "Freight" and "Additional Freight."

— No. 45. —

REPORT on the Number, Distribution, and Condition of Plants in the Government Chinchona Plantations on the Nilgiris for the half-year ending July 1875.

No. of Species.	Botanical Names.	Commercial Names.	No. of Plants.	Value per lb. of dry Bark in the London Market.	
				<i>s.</i>	<i>d.</i>
1	<i>C. Succirubra</i> - - - -	Red bark - - -	1,215,963	2	6 to 8 9
2	<i>C. Calisaya</i> - - - -	Yellow bark - - -	54,881	2	1 " 9 -
	<i>C. Calisaya</i> var. <i>Frutex</i> - - -				
	<i>C. Calisaya</i> var. <i>Vera</i> - - -				
3	<i>C. Officinalis</i> - - - -	—	—	—	—
	<i>C. Officinalis</i> var. <i>Condaminia</i> -	Original loxa bark -	1,188,159	2	10 " 7 -
	<i>C. Officinalis</i> var. <i>Bonplandiana</i> -	Select crown bark -	87,509	2	10 " 7 -
	<i>C. Officinalis</i> var. <i>Crispa</i> - - -	Fine crown bark -	4,855	2	10 " 5 6
4	<i>C. Lanceifolia</i> - - - -	Pitayo bark - - -	279	1	8 " 2 9
5	<i>C. Nitida</i> - - - -	Genuine grey bark -	2,786	1	8 " 2 10
6	<i>C. species</i> without name - - -	Fine grey bark - -	8,500	1	8 " 2 10
7	<i>C. Micrantha</i> - - - -	Grey bark - - -	46,730	1	8 " 2 9
8	<i>C. Peruviana</i> - - - -	Finest grey bark -	3,389	1	8 " 2 10
9	<i>C. Pahudiana</i> - - - -	Unknown - - -	425	Unknown.	
10	<i>C. Lanceolata</i> -leaved variety of <i>C. Officinalis</i> .	- - -	23,075	ditto.	
11	<i>C. Pitayo</i> , raised from imported seed.	- - -	28,296	ditto.	
12	<i>C. Pitayo</i> , plants brought out by Dr. Simpson.	- - -	76	ditto.	
TOTAL Number of Plants - - -			2,659,423		

TABLE showing the Growth of the different Species of Plants planted out in the Plantations for the half-year ending 31st July 1875.

No. of Plants.	Species.	Where Planted.	When Planted.	Maximum Growth.	Average Growth.	Height of the Tallest Tree.	Girth near the Ground.
				<i>Inches.</i>	<i>Inches.</i>	<i>Feet.</i>	<i>Inches.</i>
12	<i>C. Succirubra</i> - -	Neddivuttum -	30 Sept. 1862	21	6½	33½	28½
12	<i>C. officinalis</i> - -	Dodabetta - -	30 Sept. 1863	5	2½	26½	18½

TABLE showing the Propagation and Distribution of Plants and Seeds during the half-year ending 31st July 1875.

D A T E.	Total Number of Plants Propagated.	Total Number permanently Planted out.	Total Number of Plants distributed to Private Individuals.	Total Quantity of Seeds distributed.
February 1875 - - - -	—	—	- - - -	<i>Oz.</i> —
March - - - - -	1,140	- - - -	- - - -	2
April - - - - -	640	- - - -	- - - -	2½
May - - - - -	1,250	- - - -	- - - -	—
June - - - - -	- - - -	- - - -	11,500	16
July - - - - -	1,800	- - - -	43,200	2½
TOTAL - - - -	4,830	- - - -	54,700	23
Previously - - -	2,654,593	1,190,458	235,747	480½
GRAND TOTAL - - -	2,659,423	1,190,458	290,447	503½

REMARKS.

The number of plants propagated during the past half-year is 4,830, viz., 3,190 plants of *C. Angustifolia* (var. *Lanceolata*) and 1,640 of *C. Pitayensis*.

The number of plants permanently planted in the plantations remains the same as shown in the previous half-yearly report, viz., 1,190,458.

54,700 chinchona plants have been issued to the planters in Wynaad, and 23 oz. of chinchona seed supplied to the public gratuitously.

709 lbs. of green tea-leaf has been supplied to Major Jennings.

28,659 lbs. of chinchona dry bark has been shipped to England for sale in the London market.

Ootacamund, 20 August 1875.

RETURN to an Address of the Honourable The House of Commons,
dated 13 February 1877;—for,

“COPY of the RETURNS furnished by the Local Authorities in *India*
as to Number of CHRISTIANS of different Persuasions in the different
CONGREGATIONS, SALARIES of MINISTERS of RELIGION ministering
to them, &c., in reply to the Circular of the Central Government, laid
before Parliament last Year.”

India Office, }
February 1877. }

LOUIS MALLET,
Under Secretary of State.

(*Mr. O'Reilly.*)

Ordered, by The House of Commons, to be Printed,
15 February 1877.

COPY of the RETURNS furnished by the Local Authorities in *India*, as to Number of CHRISTIANS of different Persuasions in the different CONGREGATIONS ; SALARIES of MINISTERS of RELIGION ministering to them, &c. ; in reply to the Circular of the Central Government, laid before Parliament last Year.

(No. 7 of 1876.)

Government of India.—Home Department.—Ecclesiastical.

To the Most Honourable the Marquis of *Salisbury*, Her Majesty's Secretary of State for India.

My Lord Marquis,

Simla, 3 July 1876.

IN continuation of our Despatch, No. 4, dated the 24th March last, we transmit the replies of the Local Governments and Administrations (specified in the annexed list) to our letters of the 14th August and 2nd November 1872, respecting the position of Roman Catholic Priests in India who receive an allowance from Government.

2. As we stated in our former Despatch, no minutes were recorded by Members of Council on this subject. The note by the late Earl of Mayo, of the 2nd December 1870, was not brought on the proceedings of Government, for the reasons previously explained.

We have, &c.

(signed)

Lytton.

F. P. Haines, General.

H. W. Norman.

A. Hobhouse.

E. C. Bayley.

W. Muir.

A. J. Arbuthnot.

A. Clarke.

LIST OF ENCLOSURES.

	PAGE.
From Chief Commissioner of Coorg, No. 705—70, dated 6th February 1873 - - -	4
Ditto - - ditto - - Central Provinces, No. 533—29, dated 20th February 1873 -	5
From Government of Madras, No. 29, dated 17th February 1873 - - -	6
From Resident at Hyderabad, No. 12, dated 17th April 1873 - - -	8
From Military Department, No. 833, dated 22nd May 1873 - - -	10
From Government of Bengal, No. 88 V. S., dated 29th May 1873 - - -	12
Ditto - ditto - Bombay, No. 136, dated 27th June 1872 - - -	14
Ditto - ditto - Bengal, No. 287 V. S., dated 10th July 1873 - - -	19
Ditto - ditto - North-Western Provinces, No. 1857A, dated 25th July 1873 -	20
From Chief Commissioner of Oudh, No. 3679, dated 1st August 1873 - - -	22
From Government, North-Western Provinces, No. 2126A, dated 27th August 1873 -	23
From Chief Commissioner of British Burma, No. 1339—14, dated 3rd September 1873 -	23
From Government of the Punjab, No. 4103, dated 3rd November 1873 - - -	25

ENCLOSURES.

(Ecclesiastical—March 1876.)

No. 705—70, dated Camp Chennarayaputana, the 6th February 1873.

From *J. Puckle*, Esq., Officiating Secretary to the Chief Commissioner of Coorg, to the Secretary to the Government of India.

I HAVE the honour, by direction of the Chief Commissioner, to acknowledge the receipt of your letter, No. 390, dated 2nd November last, calling for information under certain heads regarding each charge in Coorg to which a Presbyterian Chaplain now stands appointed, and for similar details regarding the charges of Roman Catholic Chaplains and Roman Catholic Priests now receiving aid from Government.

2. In reply, I am directed to submit a statement giving the details required, and to state that no charges are incurred on account of a Presbyterian Chaplain, nor are there any Presbyterian services held in the Province.

3. The only charge incurred on account of Roman Catholic Chaplains and Roman Catholic Priests is an allowance of 20 rupees granted to the Roman Catholic Priest at Veerajendrapett under the sanction conveyed in para. 4 of letter, dated 24th June 1834, No. 36, from the Secretary to the Government of India in the Political Department.

STATEMENT showing the Number of EUROPEANS, &c., who are PRESBYTERIANS or Attendants on the PRESBYTERIAN SERVICES, and those who are ROMAN CATHOLICS, in the Province of *Coorg*.

1. Total Number of European, Eurasian, and American Civil Population who are—			2. Number out of the Total who are on the Service of Government and of their Families.		3. Number out of those shown under (2) who are European British Subjects or Americans.	
	Men.	Women and Children.	Men.	Women and Children.	Men.	Women and Children.
Presbyterians -	Europeans - 24	Europeans - 7	—	—	—	—
	Eurasian - 1	Eurasians - —	—	—	—	—
Roman Catholics -	Europeans - 3	Europeans - 3	—	—	—	—
	Eurasians - 16	Eurasians - 23	Eurasians - 4	Eurasian - 1	—	—

Remarks.—No European troops are serving in Coorg.

J. Puckle,
Officiating Secretary to the Chief Commissioner of Coorg.

(Ecclesiastical—March 1876.)

No. 533—29, dated Nagpur, the 20th February 1873.

From *L. Neill*, Esq., Assistant Secretary to the Chief Commissioner of the Central Provinces, to the Secretary to the Government of India.

I AM desired to acknowledge the receipt of your letter, No. 388, of the 2nd November last, and endorsement, No. 375, of the same date, and in reply to state that there are no charges to which a Presbyterian Chaplain or a Presbyterian Minister, not being a Chaplain, stand appointed in these Provinces, or are there any charges of Church of England Clergymen who are not Government Chaplains. There are four Church of England charges, and a list of the Chaplains, Bengal Establishment, appointed to them, with a statistical detail of the members or attendants on the services of that church are given in Appendix (A.) In Appendix (B.), in the same way, are given the names of the priests and statistics of the congregation of the three Roman Catholic charges in these Provinces. In submitting these statements, I am only to remark that in many of the Census schedules, filled up at the enumeration last year, the religious sect or church to which a person belonged has not been fully stated, Presbyterians, for instance, returning themselves as Protestants; but the defects have been repaired as far as it is possible to do so, and the returns now submitted are believed to be approximately correct.

(A.)

RETURN showing the Number of EUROPEANS, EURASIANS, and AMERICANS in the CENTRAL PROVINCES, who are Members of the CHURCH of ENGLAND, or Attendants on the Services of that Church.

STATION.	Name of Chaplain of Bengal Establishment.	(A.) Number of European Troops who are Members of the Church of England, or Attendants on the Services of that Church, and of the Women and Children belonging to them.				(B.) Total Number of European, Eurasian, and American Civil Population, who are Members of the Church of England, or Attendants on its Services.				(C.) Number out of the Total (B.) who are in the Service of Government and their Families.				(D.) Number out of those shown under (C.) who are European British-born Subjects, or Americans, and of their Families.			
		Men.	Women.	Children.	Total.	Men.	Women.	Children.	Total.	Men.	Women.	Children.	Total.	Men.	Women.	Children.	Total.
Nagpur - -	(a)	30	5	9	44	181	155	91	427	147	144	85	376	99	95	62	256
Amthi - -	(b)	726	68	86	880	32	45	47	124	26	42	44	112	23	37	36	96
Bulbulpore -	(c)	311	24	40	375	169	103	85	357	41	21	33	95	34	18	27	79
Nagpur - -	(d)	274	12	27	313	24	12	16	52	19	10	13	42	17	9	11	37

(a) Rev. G. T. Caruthers, M.A. (b) Rev. W. H. Gale, B.A. (c) Rev. W. B. Drawbridge, M.A. (d) Rev. B. Hammond.
L. Neill,
Nagpur, 20 February 1873. Assistant Secretary to the Chief Commissioner, Central Provinces.

(B.)

RETURN showing the Number of EUROPEAN, EURASIAN, and AMERICAN POPULATION in the CENTRAL PROVINCES, who are Members of the ROMAN CATHOLIC CHURCH, or Attendants on the Services of that Church.

STATION.	Name of Chaplain.	(A.) Number of European Troops who are Members of the Roman Catholic Church or Attendants on the Services of that Church, and of the Women and Children belonging to them.				(B.) Total Number of European, Eurasian, and American Civil Population, who are Members of the Roman Catholic Church, or Attendants on its Services.				(C.) Number out of the Total (B.) who are in the Service of Government and their Families.				(D.) Number out of those shown under (C.) who are European British-born Subjects, or Americans, and of their Families.			
		Men.	Women.	Children.	Total.	Men.	Women.	Children.	Total.	Men.	Women.	Children.	Total.	Men.	Women.	Children.	Total.
Amthi - -	(a)	248	70	111	429	25	39	55	119	19	24	35	78	5	1	2	8
Bulbulpore -	(b)	173	27	52	252	37	21	22	80	21	14	15	50	7	3	4	14
Nagpur - -	(c)	122	8	19	149	11	4	12	27	7	3	6	16	1	-	-	1

(a) Rev. J. M. Desbornes, 200 rupees per mensem. (b) Rev. — Delaley, 150 rupees per mensem. (c) Rev. — Raphael, 150 rupees per mensem.
L. Neill,
Nagpur, 20 February 1873. Assistant Secretary to the Chief Commissioner, Central Provinces.

(Ecclesiastical—March 1876.)

No. 29, dated Fort St. George, the 17th February 1873.

From the Honourable *W. Hudleston*, Chief Secretary to the Government of Madras, to the Secretary to the Government of India.

WITH reference to the letters noted marginally, I am directed to transmit two Returns regarding the Presbyterian Chaplains on the Madras Ecclesiastical Establishment, and two Returns of the Roman Catholic Priests who receive an allowance from Government.

From Officiating Under Secretary to Government of India, Home Department, dated 14th August 1872, No. 263.

From Officiating Secretary to Government of India, Home Department, dated 2nd November 1872, No. 382.

STATEMENT showing the Number of PRESBYTERIAN CHAPLAINS in the MADRAS ECCLESIASTICAL ESTABLISHMENT, the Station at which each is now Posted, the Strength of European Troops at each Station, the Number of European and Eurasian Civil Population at each, and the Salary of each Chaplain.

NUMBER OF CHAPLAINS.	Station at which Posted.	Strength of European Troops.			European and Eurasian Civil Population at each.	Total.	Salary of each Chaplain.	REMARKS.
		Men.	Women.	Children.				
1. Rev. Alexander Walker, Senior Chaplain.	Madras -	133	8	26	385	565	Rs. 800	N.B.—The Senior Chaplain draws a special allowance of 150 rupees per month, and Presidency house rent at the rate of 130 per mensem.
2. —, Assistant Chaplain	—	—	—	—	—	—	—	
3. Rev. Augustus Clifford Bell, M.A., Chaplain.	Bangalore -	185	21	38	231	475	800	The Chaplain at Secunderabad draws carriage allowance 50 rupees, and 30 rupees for visiting out-stations.
4. Rev. William Alexander Liston, Assistant Chaplain.	Secunderabad	206	{ Women and Children, 86 }		100	392	500	

Madras, 20 November 1872.

A. Walker,
Senior Chaplain, Church of Scotland.

STATEMENT showing the Number of PRESBYTERIAN CHAPLAINS in the MADRAS ECCLESIASTICAL ESTABLISHMENT, the Station at which each is now Posted, the Strength of European Troops at each Station, the Number of European and Eurasian Civil Population at each, and the Salary of each Chaplain, in accordance with Order of Government No. 210, dated 15th November 1872.

NUMBER OF CHAPLAINS.	Station at which Posted.	Number of Presbyterian Troops.			Number of Presbyterian Civil Population.			Number of Civil Population in the Service of Government.			Number of Civil Population who are European British-born Subjects or Americans.			Total of Presbyterians at Madras, Bangalore, and Secunderabad.	SALARIES.
		Officers and Men.	Women.	Children.	Men.	Women.	Children.	Men.	Women.	Children.	Men.	Women.	Children.		
1. Rev. Alexander Walker, Senior Chaplain	Madras -	146	8	26	111	109	252	38	33	103	62	43	101	652	Rs. Salary - - 800
2. —, Assistant Chaplain															Special allowance - - 150
3. Rev. Augustus Clifford Bell, M.A., Chaplain.	Bangalore -	206	35	61	52	74	53	7	8	8	5	3	2	481	House-rent - 130
4. Rev. William Alexander Liston.	Secunderabad	251	36	71	32	28	57	{ Almost all are employed in His Highness the Nizam's service }			-	-	-	475	Salary - - 500
TOTAL	-	603	79	158	195	211	362	-	-	-	-	-	-	1,608	Carriage allowance - - 50
															Visiting out-stations - 30

Madras, 20 January 1873.

A. Walker,
Senior Chaplain, Church of Scotland.

STATEMENT showing the Stations at which Roman Catholic and Eurasian Population (Protestant and Catholic) of every such Station.

N A M E OF THE S T A T I O N.	Name of Roman Catholic Chaplain who receives an Allowance from Government at the Station.	Amount of Allowance.	Circumstances under which the Allowance is granted.	Total Strength of the European Troops at the Station.	The Number of Troops professing the Roman Catholic Religion.	Total Strength of the European and Eurasian Civil Population of the Station.	Total Roman Catholic European and Eurasian Civil Population of the Station.
Madras -	Very Rev. J. Colgan -	200 rupees, with 30 rupees horse allow- ance, and 23 rupees for Church Estab- lishment.	For ministering to the Roman Catholic European troops in Garrison and attendance at General Hospital.	927 (including women and children, 1,463).	203 (including women and children, 402).	14,163	5,546.
St. Thomas' Mount	Rev. D. Forde -	200 rupees, with 23 rupees for Church Establishment.	For ministering to the Roman Catholic European troops at the station.	414 (including women and children, 706).	98 (including women and children, 185).	517	216.
Palaveram -	Rev. W. H. Conley -	150 rupees, with 23 rupees for Church Establishment.	- ditto - ditto -	112 - - -	308 (inclusive of women and children).	173	80.
Poonamallee -	Rev. F. R. Ryan -	150 rupees, with 23 rupees for Church Establishment.	- ditto - ditto -	164 - - -	54 (including women and children, 92).	441	340.
Bellary -	Rev. P. Doyle -	200 rupees, with 30 rupees horse allow- ance, and 23 rupees for Church Estab- lishment.	For ministering to the Roman Catholic troops at the station.	1,166 - - -	287 (including women and children, 470).	130 (including women and chil- dren, 462).	35 (including women and chil- dren, 144).
Secunderabad -	Rev. C. Tagliabue -	200 rupees, 30 rupees horse allowance, and 23 rupees for Church Establish- ment.	- ditto - ditto -	About 3,000 - - -	1,021 (inclusive of women and children).	Not furnished	403.
Kampili -	Rev. V. Bigi - Rev. F. Pozzi - Rev. J. M. Desbornes -	150 rupees - ditto - ditto - 100 rupees - ditto - ditto - 200 rupees, with 23 rupees for Church Establishment.	- ditto - ditto - - ditto - ditto - - ditto - ditto -	1,200 (including women and children, 1,609).	507 - - -	252 - - -	180.
Bangalore -	Rev. J. A. Chevalier - Rev. E. Gasnier, Assis- tant Roman Catholic Chaplain.	200 rupees, with 30 rupees horse allow- ance, and 23 rupees for Church Establishment. 150 rupees - ditto - ditto -	- ditto - ditto - - ditto - ditto -	1,604 (including women and children, 2,581).	542 (including women and children, 630).	688 (including women and chil- dren, 3,600).	216 (including women and chil- dren, 978).
Wellington -	Rev. J. Portier -	150 rupees, with 23 rupees for Church Establishment.	- ditto - ditto -	394 (including women and children, 607).	170 (inclusive of women and children).	23	17.
Trichinopoly -	Rev. J. Ford -	- ditto - ditto -	- ditto - ditto -	300 - - -	120 (including women and children, 250).	450	156.
Ootacamund -	Rev. F. Triquet -	30 rupees - - -	For ministering to the European prisoners in the prison at that station.	- - -	- - -	- - -	- - -
Calicut and Mullia- poom.	Rev. F. Alphonsus -	150 rupees, with 15 rupees for Church Establishment, and travelling allow- ance for visiting Mulliapoorum.	For ministering to the Roman Catholic troops at Calicut and Mulliapoorum.	- - -	- - -	- - -	- - -
Cannanore -	Rev. F. Luis -	150 rupees, and 23 rupees for Church Establishment.	For ministering to the Roman Catholic troops at the station.	- - -	- - -	- - -	- - -

The population returns of the last three stations not yet received. They will be furnished hereafter.

+ S. Fennelly.

STATEMENT showing the STATIONS in the MADRAS PRESIDENCY at which ROMAN CATHOLIC PRIESTS receive an ALLOWANCE from GOVERNMENT, the Circumstances under which such Allowance is Paid, and the Number of Roman Catholic European Troops, and of the Women and Children belonging to them at each such Station; also the Total Number of Roman Catholic European, Eurasian, and American Civil Population who are in the Service of Government, with the Women and Children belonging to them; and, finally, the Total Number of Roman Catholic British-born Europeans and Americans in the Service of Government, with their Families.

1. STATION.	2. Roman Catholic Priest who receives an Allowance from Government.	3. Circumstances under which the Allowance is granted.	4. Number of European Roman Catholic Troops at the Station.			5. Roman Catholic European, American, and Eurasian Civil Population.			6. Roman Catholic Europeans, Eurasians, and Americans in the Service (not Military) of Government.			7. Roman Catholic Europeans (British-born) and Americans in the Service (not Military) of Government.		
			Men.	Women.	Children.	Men.	Women.	Children.	Men.	Women.	Children.	Men.	Women.	Children.
Madras - -	Very Rev. J. Colgan, 200 rupees, 23 rupees church allowance, and 30 rupees for horse allowance.	For ministering to the spiritual wants of the European troops.	203	71	128	1,788	1,665	2,093	355	348	1,027	28	23	63
Saint Thomas' Mount.	Rev. D. Forde, 200 rupees, and 23 rupees church allowance.	- ditto - ditto -	98	27	60	34	52	117	8	2	2	1	-	-
Palaveram - -	Rev. W. H. Conley, 150 rupees, and 23 rupees church allowance.	- ditto - ditto -	74	63	171	30	15	35	-	-	-	-	-	-
Poonamallee -	Rev. F. R. Ryan, 150 rupees, and 23 rupees church allowance.	- ditto - ditto -	51	27	35	13	13	48	3	2	20	-	-	-
Bellary - -	Rev. P. Doyle, 200 rupees, 23 rupees church allowance, and 30 rupees horse allowance.	- ditto - ditto -	287	68	115	35	28	81	6	5	14	1	-	-
Secunderabad -	Rev. C. Tagliabue, 200 rupees, 30 rupees horse allowance, and 23 rupees for church.	- ditto - ditto -	667	97	198	126	98	242	65	48	86	17	13	35
	Rev. V. Bigi, 150 rupees, 30 rupees horse allowance, and 23 rupees for church.													
	Rev. F. Pozzi, 100 rupees -													
Kampti - -	Rev. J. M. Desbornes, 200 rupees, and 23 rupees church allowance.	- ditto - ditto -	288	82	137	89	63	128	41	27	39	11	5	-
Bangalore - -	Rev. J. A. Chevalier, 200 rupees, church allowance 23 rupees, and 30 rupees horse allowance.	- ditto - ditto -	542	90	148	216	246	516	38	30	76	6	4	11
	Rev. E. Gasnier, 150 rupees -	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichinopoly -	Rev. J. Dupuy, 150 rupees, and 23 rupees church allowance.	- ditto - ditto -	150	65	75	65	50	41	40	15	20	5	6	9
Wellington -	Rev. J. Pottier, 150 rupees, and 23 rupees church allowance.	- ditto - ditto -	75	28	67	3	6	8	-	-	-	-	-	-
Cannanore - -	Rev. F. Luis, 150 rupees, and 23 rupees church allowance.	- ditto - ditto -	398	105	240	200	221	153	-	-	-	-	-	-
Calicut - -	Rev. F. Alphonsus, 100 rupees, church allowance 14 rupees, and travelling allowance 48 rupees.	- ditto - ditto -	60	3	3	130	153	443	49	43	194	3	3	13
Ootacamund -	Rev. F. Triquet, 30 rupees -	For ministering to the spiritual wants of the inmates of the European Prison.	-	-	-	47	35	60	9	5	20	3	3	9

Madras, 6 February 1873.

+ S. Fennelly.

(Ecclesiastical—March 1876.)

No. 12, dated Haidarabad, the 17th April 1873.

From Major W. Tweedie, First Assistant Resident at Haidarabad, to the Secretary to the Government of India.

As requested in your office letter, No. 391, of the 2nd November last, the Resident has the honour to submit the accompanying statement, showing, as far as can be ascertained, the number of Europeans and others who are Presbyterians or attendants on Presbyterian services throughout the several localities, situated in His Highness the Nizam's country, which are noted in the margin.

2. Similar details regarding the charge of Roman Catholic Chaplains and Priests are also embodied in the statement.

3. There are no Roman Catholic Chaplains or Presbyterian Ministers appointed specially for the places above indicated, nor does it appear that the Chaplains or Ministers who officiate at the above places receive any remuneration from Government for their services.

4. Similar statistics for Berar, which it may here be mentioned is ecclesiastically under the Bishop of Madras, are reported by the Commissioners not to be obtainable, as there is no Presbyterian or Roman Catholic Chaplains located in the Province.

The Residency Bazaars.
Haidarabad.
Gulburgah.
Jaulnah.
Mominabad.
Lingasogoor.
Bolarum.
Hingolee.

LIST of EUROPEAN, EURASIAN, and AMERICAN POPULATIONS residing in the following Stations of the HAIDARABAD TERRITORY who are Members of the PRESBYTERIAN and ROMISH CHURCHES.

1. STATIONS.	Members of the Church of Scotland.						Members of the Church of Rome.						European British-born Subjects.			Number in the Service of Government.							
	2. Europeans.		3. Eurasians.		4. European British-born Subjects or Americans.		5. Total.		6. Europeans.		7. Eurasians.		8. European British born Subjects or Americans.		9. Total.		10. Of Church of Scotland.		11. Of Church of Rome.		12. European.	13.	14. American.
	Families.		Families.		Families.		Families.		Families.		Families.		Families.		Families.		Families.		Families.		Men.	Men.	Men.
	Men.	Women.	Men.	Children.	Men.	Women.	Men.	Children.	Men.	Women.	Men.	Children.	Men.	Women.	Men.	Children.	Men.	Women.	Men.	Children.			
Residency Bazaars	3	-	1	1	7	4	1	7	4	-	10	4	5	14	4	5	1	-	1	-	2	19	-
Gulburgah	-	-	-	-	126	244	85	-	-	-	-	-	-	-	-	-	44	23	-	-	-	-	-
Haiderabad	-	-	-	-	-	-	41	-	-	-	-	-	-	-	193	-	-	2	9	-	-	-	-
HAIDARABAD ASSIGNED DISTRICTS:																							
Jaulnah	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montenahad	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lineogoor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bolarum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hingolee	-	-	1	1	2	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

W. Tweedie, Major,
First Assistant Resident at Haiderabad.

17 April 1873.

(Ecclesiastical—March 1876.)

EXTRACT from the Proceedings of the Government of Madras in the Military Department, dated Fort St. George, the 7th May 1873.

READ the following letter :

No. 259, dated Fort St. George, the 2nd May 1873.

From Major *G. D. Beresford*, Officiating Assistant Adjutant General, Madras, to the Secretary to the Government of Madras, Military Department.

WITH reference to the Proceedings of Government, No. 3867, dated 7th December 1872, I have the honour, by order of the Commander-in-Chief, to forward the accompanying return showing the number of European troops serving in the Madras Presidency, who are Presbyterians, or attendants on the Presbyterian services, and Roman Catholics, and of the women and children belonging to them, together with the charges of the Presbyterian Ministers or Roman Catholic Chaplains, &c., receiving aid from Government.

(No. 1579.)

COPY of the above, with the return, forwarded to the Officiating Military Secretary to the Government of India for submission to the Right Honourable the Governor General in Council, with reference to Lieutenant-Colonel Lees' docket, No. 887, dated 20th November 1872.

(True Extract.)

(signed) *A. C. Silver*, Colonel,
Secretary to the Governor of Madras.

No. 833 (Returns), dated Fort William, the 22nd May 1873.

Endorsed by the Military Department.

COPY of the foregoing, with the return in original, forwarded to the Home Department for information with reference to the docket from this Department, No. 889, dated 20th November 1872.

RETURN showing the Number of EUROPEAN TROOPS serving in the MADRAS PRESIDENCY who are PRESBYTERIANS and ROMAN CATHOLICS, with the Women and Children belonging to them.

STATION.	Number of European Troops who are Presbyterians or Attendants on the Presbyterian Services, and Women and Children belonging to them.			Number of European Troops who are Roman Catholics or Attendants on Roman Catholic Services, and Women and Children belonging to them.			Roman Catholic Chaplains or Priests receiving Aid from Government.	Specification and Nature of Charge.	Amount of Specification of Aid.		REMARKS.
	Men.	Women.	Children.	Men.	Women.	Children.			Rs.	Rs.	
Mysore Division	86	6	18	542	90	148	Rev. J. A. Chevalier -	Chaplain -	-	200	The Roman Catholic Chaplain at Calicut visits the detachment generally once a month.
	-	-	-	-	-	-	Rev. E. Gasnier -	Assistant Chaplain -	150	203	
Wellington	9	4	4	26	12	32	Rev. J. M. Pottier -	Catholic Chaplain -	150	173	
	-	-	-	-	-	-	Rev. M. Lewis -	ditto -	-	150	
Provinces of Malabar and Canara.	39	1	4	152	21	21	Rev. F. Alphonsus -	ditto -	-	100	
	2	-	-	9	4	1	-	-	-	-	
Ceded Districts, Bellary	33	3	6	324	71	114	Rev. P. Doyle -	Catholic Priest -	200	253	
	-	-	-	-	-	-	-	-	-	-	
Hyderabad Sub-sidiary Force.	230	30	87	860	96	176	Rev. C. Tagliabue -	ditto -	200	253	The Presbyterian Troops are under the charge of the Rev. Mr. Liston, Chaplain, Church of Scotland, who draws 500 rupees per month.
	-	-	-	-	-	-	Rev. V. Bigi -	ditto -	150	203	
Nagpur Force, Kampi	45	8	16	248	70	111	Rev. F. Pozzie -	ditto -	-	100	
	-	-	-	-	-	-	Rev. J. M. Desboces -	Catholic Chaplain -	Per mensem, exclusive of travelling batta	200	
British Burma Division.	129	4	14	400	61	145	Rev. - Bernard -	Catholic Priest -	-	200	
	31	3	3	257	43	92	Rev. - Petit -	ditto -	-	150	
Tonghoo	22	3	4	199	36	75	Rev. - Biffi -	ditto -	-	150	
	2	1	2	28	5	12	-	-	-	150	
Northern District.	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	
Fort Saint George	102	8	10	287	24	69	-	Two Catholic Priests -	Neither of them received any Government aid.	-	The Presbyterian Troops are under the charge of the Rev. Mr. Liston, Chaplain, Church of Scotland, who draws 500 rupees per month.
	-	-	-	-	-	-	Rev. E. Lee -	Catholic Chaplain -	Per mensem -	200	
St. Thomas' Mount	13	3	5	69	22	55	Rev. D. Forde -	Catholic Priest -	Per mensem -	200	
	-	-	-	-	-	-	Rev. W. H. Conley -	Catholic Priest -	Establishment allowance -	23	
Palaveram	4	-	5	66	63	171	Rev. F. R. Ryan -	Catholic Chaplain -	Per mensem -	150	
	10	1	-	36	15	30	-	ditto -	-	150	
Poonamallee	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	
Trichinopoly	26	3	10	101	14	22	Rev. J. Forde -	Catholic Priest -	ditto -	150	
	-	-	-	-	-	-	-	-	Extra charge for lighting and cleaning the church -	23	

N.B.—There is no Presbyterian Minister (not a Chaplain) in any of the above stations receiving remuneration from Government.

Fort St. George, 2 May 1873.

G. D. Beresford, Major,
Officiating Assistant Adjutant General, Madras.

(Ecclesiastical—March 1876.)

No. 88 V. S., dated Calcutta, 29th May 1873.

From *H. J. S. Cotton*, Esq., Officiating Under Secretary to the Government of Bengal, General Department,
to the Secretary to the Government of India.

WITH reference to the orders of His Excellency the Governor General in Council, contained in G. G. O., No. 265 and 384, of the 14th August and 2nd November 1872, respectively, I am directed to submit to the Government of India the accompanying Statements.

Statement (A.) shows the present disposal of Presbyterian Chaplains on the Bengal Establishment, and the station to which each is now posted, with details required.

Statement (B.) gives the same particulars as regards the charge of each Presbyterian Minister who, not being a Chaplain, receives directly or indirectly any portion of his remuneration from the Government.

Statement (C.) gives similar information as to the charges of Roman Catholic Priests who receive any salary or allowance from Government.

2. Returns showing the charges of Chaplains on the Bengal Establishment and of every Church of England Clergyman who, not being a Chaplain, receives some remuneration from the Government, have been furnished to the Right Reverend the Lord Bishop of Calcutta.

STATEMENT (A.)

CHAPLAINS of the CHURCH of SCOTLAND.

STATION.	NAME OF CHAPLAIN.	Pay.	(A.)		(B.)		(C.)		(D.)	
			Number of European Troops at the Station who are Presbyterians or Attendants on Presbyterian Services.		Number of European, Eurasian, and American Civil Population who are Presbyterians or Attendants on Presbyterian Services.		Number of those in Column (B.) who are in the Service of Government, and their Families.		Number of those in Column (C.) who are European British-born Subjects or Americans, and their Families.	
			Troops.	Women and Children belonging to them.	Men.	Women and Children.	Men.	Women and Children.	Men.	Women and Children.
St. Andrew's Church	The Rev. J. M. Thompson -	Rs. 800	65	30	266	414	68	106	37	47
	Conveyance Allowance -	50								
	House-rent - - -	170								
		1,020								

H. J. S. Cotton,
Officiating Under Secretary to the Government of Bengal.

STATEMENT (B.)

PRESBYTERIAN MINISTERS, not CHAPLAINS, but receiving some Remuneration from Government.

STATION.	NAME.	NATURE OF CHARGE.	Amount and Shape of Aid received from Government.	(A.)		(B.)		(C.)		(D.)	
				Number of European Troops at the Station who are Presbyterians or Attendants on Presbyterian Services.		Number of European, Eurasian, and American Civil Population who are Presbyterians or Attendants on Presbyterian Services.		Number of those in Column (B.) who are in the Service of Government, and their Families.		Number of those in Column (C.) who are European British-born Subjects or Americans, and their Families.	
				Troops.	Women and Children belonging to them.	Men.	Women and Children.	Men.	Women and Children.	Men.	Women and Children.
Dum-Dum	Rev. Mr. Jardine	Visits the Presbyterian troops at Dum-Dum every Sunday morning.	Is allowed 12 rupees a visit as travelling allowance.	72	30	-	-	-	-	-	-

H. J. S. Cotton,

Officiating Under Secretary to the Government of Bengal.

STATEMENT (C.)

CHAPLAINS of the ROMAN CATHOLIC CHURCH.

STATION.	NAME.	Salary or Allowance.	(A.)		(B.)		(C.)		(D.)	
			Number of European Troops at the Station who are Roman Catholics or Attendants on the Services of the Roman Catholic Priests.		Number of European, Eurasian and American Civil Population who are Roman Catholics or Attendants on Services of the Roman Catholic Priests.		Number of those in Column (B.) who are in the Service of Government, and their Families.		Number of those in Column (C.) who are European British-born Subjects or Americans, and their Families.	
			Troops.	Women and Children.	Men.	Women and Children.	Men.	Women and Children.	Men.	Women and Children.
Fort William	Rev. A. Darrebare	Rs. 200	346	170	8	44	2	9	2	9
	House allowance	30								
	Church cleaning, &c.	33								
		263								
Dum-Dum	Rev. F. DeCock	150	170	75	5	12	2	5	2	5
	Church allowance	23								
		173								
Barrackpore	Rev. J. Fitzpatrick	150	116	45	8	17	3	3	-	-
Presidency Gaol	Rev. V. Verlinden	75	4	-	35	1	1	-	93	1
Darjeeling	Rev. Father Accursio	200 a.	Has declared himself unable to give the information. A further call will be made.							
Hazaribagh	Rev. Father Philip	200	286	129	7	19	7	13	5	12
Dinapore	Rev. Father Lewis	200	243	136	50	174	4	16	45	174

H. J. S. Cotton,

Officiating Under Secretary to the Government of Bengal.

(Ecclesiastical—March 1876.)

No. 136, dated Bombay Castle, the 27th June 1872.

From the Secretary to the Government of Bombay, Ecclesiastical Department, to the Secretary to the Government of India.

No. 247, dated 27th July 1872.
No. 264, dated 14th August 1872.
No. 381, dated 2nd November 1872.
No. 383, dated 2nd November 1872.

I HAVE the honour to acknowledge the receipt of your letters as per margin, calling for certain information in order to assist the Government of India in the decision on the general question of ecclesiastical establishments now pending before it.

Your first letter specifies in detail certain points upon which information is sought with regard to the Church of England Establishment, as follows:—

The number of Chaplains on the Bombay Establishment, showing the station at which each is now posted, and the salary drawn by each.

The strength of European troops at each station.

The number of European and Eurasian population at each station.

A statement showing the name of each Church of England Clergyman, who, not being a Government Chaplain, receives a portion of his salary from Government, with particulars as to the nature of each charge, &c.

Your letter, No. 381, dated 2nd November 1872, calls for further details regarding the same establishment, as follows:

(a.) Number of European troops at each station who are members of the Church of England or attendants on the services of that church, and of the women and children belonging to them.

(b.) Total number of European, Eurasian, and American civil population who are members of the Church of England or attendants on its services.

(c.) Number out of the total (b) who are in the services of the Government, and of their families.

(d.) Number out of those shown under (c) who are European British-born subjects or Americans, and of their families under each head; the number of women and children should be separately stated.

Your second letter calls for the same information as required in your first in respect to the Presbyterian Establishment; and in addition it calls for a return of Roman Catholic priests who receive any salary or allowance from Government, with particulars and circumstances under which such salary or allowance is granted.

Your last letter requires that the same information sought in your third should also be furnished in regard to the Presbyterian Establishment.

In reply, I am desirous to submit the following statements, which furnish in detail the information required by your first letter:—

Statement No. 1, showing the number of Chaplains on the Bombay Establishment, the stations at which they are posted, and the salary drawn by each.

Statement No. 2, showing the strength of European troops at each station in the Bombay Presidency.

Statement No. 3, showing the number of European and Eurasian population at each station under the Bombay Presidency.

Statement No. 4, showing the number of each Church of England Clergyman who, not being a Government Chaplain, receives a portion of his salary from Government, with particulars as to the nature of each charge, &c.

The accompanying Statement No. 5 contains the information required in your letter No. 381, dated 2nd November, so far as it has been possible to furnish it.

These statements are necessarily not so accurate as they might have been if the result of the recent Census had been made known.

With regard to the Presbyterian Establishment, the Senior Chaplain, Church of Scotland, gives much of the information required in the following paragraph:

“That the number of Chaplains on the Bombay Ecclesiastical Establishment of the Church of Scotland was in 1859 fixed at four.

“That these were thus posted—The Senior Chaplain and Assistant Chaplain at Bombay,

SALARIES OF MINISTERS OF RELIGION, &c. (EAST INDIA). 15

Bombay, salaries 980 rupees and 500 rupees per mensem, respectively. A Chaplain for Puna and Kirkee, salary 800 rupees per mensem.

"An Assistant Chaplain at Kurrachi, salary 500 rupees per mensem.

"That there is not any Presbyterian Clergyman who, not being a Government Chaplain, receives a portion of his salary from Government."

The particulars required in your letter No. 383, dated 2nd November, are contained in the accompanying Statement No. 6.

The Statement No. 7 has been prepared by the Controller of Military Accounts, and gives the number of Roman Catholic priests who receive any salary or allowance from Government, with particulars and circumstances under which such salary or allowance is granted, as demanded in your letter No. 264, dated 14th August 1872.

In conclusion, I am desired to express regret at the apparently great delay which has occurred in replying to the communications above referred to, but the nature of the inquiry embraced so wide a range that delay in the collection of the required information in a complete form was unavoidable.

No. 1.

STATEMENT showing the Number of the CHAPLAINS ON BOMBAY ESTABLISHMENT, the STATIONS at which they are Posted, and the SALARY drawn by each.

NAMES.	Salary.	STATION.	REMARKS.
SENIOR CHAPLAINS.			
	<i>Rs. a. p.</i>		
The Rev. E. Newton Dickson -	950 - -	Dharwar and Concan stations.	The Senior Chaplain.
" W. H. Cummins, M.A. -	800 - -	Sattara with Mahableshwur.	Residing at Sattara and visiting Mahableshwur, except in hot season when residing at Mahableshwur.
" G. A. F. Watson, M.A. -	800 - -	Puna with Poorundhur.	Visiting Poorundhur once a month, except in hot season, when twice.
" C. T. Wilson, M.A. -	800 - -	Aden.	
" R. Easum, M.A. -	483 5 4	Europe - - -	Sick certificate.
" A. Miller, B.A. -	800 - -	Deesa with Abu - -	Visiting Abu.
Venerable C. H. Leigh Lye, M.A. -	1,066 10 8	Bombay - - -	Archdeacon and Senior Presidency Chaplain visiting Tanna, Matheeran, and Bandora.
The Rev. H. H. Pace - - -	800 - -	Belgaum (Camp) -	Visiting Fort.
" W. L. Eames, M.A. - -	800 - -	Puna, Gorpoorie - -	Visiting Sholapur once a month (on privilege leave).
" W. Maule, LL.B. - - -	800 - -	Colaba - - -	On three months' privilege (leave from 11th March).
" H. W. Bagnell, B.A. -	800 - -	Ahmadnagar.	
JUNIOR CHAPLAINS.			
The Rev. S. Stead, M.A. - -	292 10 8	Europe - - -	Sick certificate.
" T. Horsfall - - -	500 - -	Deolali - - -	Visiting Asirgarh.
" A. L. Onslow, B.A. - -	292 10 -	Europe - - -	Furlough on private affairs.
" G. C. Raynell, M.A. - -	500 - -	Byculla.	
" C. Walford, M.A. - - -	500 - -	Rajkote with Bhooj.	
" A. Polehampton - - -	500 - -	Kirkee - - -	Acting.
" J. H. T. Blunt, M.A. - -	292 10 8	Europe - - -	Sick certificate.
" W. Jones - - -	500 - -	Puna, St. Paul's	Acting at St. Paul's and at Gorpoorie.
" F. L. Sharpin, M.A. - -	500 - -	Bombay - - -	Garrison Chaplain visiting Butcher's Island when troops there.
" W. J. Pfennell, M.A. - -	500 - -	Haidarabad, Sind.	
" G. B. Streeton, M.A. - -	500 - -	Kurrachi - - -	Visiting Manora and Ghizree.
" G. B. Anderson, B.A. - -	250 - -	Europe - - -	Sick certificate.
" J. Higgins - - -	500 - -	Nasirabad - - -	Visiting Neemuch, Ajmere, and other stations.
" C. Kirk, M.A. - - -	292 10 8	Europe - - -	Sick certificate.
" W. Clark, M.A. - - -	500 - -	Kurrachi - - -	Joint Chaplain.
" C. F. H. Johnston, M.A. -	292 10 8	Europe - - -	Sick certificate.
" P. H. LeFeuvre, B.A. - -	292 10 8	Europe - - -	- ditto.
" A. G. Cane, M.A. - - -	500 - -	Ahmedabad - - -	Visiting Surat and dependent Stations.

No. 2.

STATEMENT showing the Strength of EUROPEAN TROOPS at each STATION in the BOMBAY PRESIDENCY.

STATIONS.	Commis- sioned Officers, all Ranks.	Unattached List, all Ranks.	British Corps, Non- commis- sioned Officers and Men.	Total, all Ranks.	STATIONS.	Commis- sioned Officers, all Ranks.	Unattached List, all Ranks.	British Corps, Non- commis- sioned Officers and Men.	Total, all Ranks.
Puna Division :					Mhow Division— <i>contd.</i>				
Puna - - -	190	48	2,043	2,281	Angur - - -	3	-	-	3
Kirkee - - -	31	12	438	481	Mahidpur - - -	6	-	-	6
Ahmadnagar - - -	30	7	609	646	Neemuch - - -	34	9	472	515
Sholapur - - -	7	2	-	9	Nasirabad - - -	40	5	696	741
Asirgarh - - -	8	2	130	140	Bombay District :				
Sattara - - -	14	8	209	231	Bombay - - -	77	66	31	174
Malligaum - - -	9	1	-	10	Colaba - - -	15	10	478	503
Dhulia - - -	9	-	-	9	Deolalee - - -	6	11	19	36
Sirur - - -	6	-	-	6	Tanna - - -	5	1	-	6
Poorundhur - - -	3	6	27	36	Sind District :				
Northern Division :					Kurrachi - - -	47	17	777	841
Ahmedabad - - -	32	9	41	182	Ghizree - - -	3	3	31	37
Deesa - - -	46	3	932	981	Haidarabad - - -	21	14	398	433
Mount Aboo - - -	4	4	104	112	Jacobabad - - -	21	-	-	21
Baroda - - -	7	-	24	31	Belgaum District :				
Surat - - -	8	-	-	8	Belgaum - - -	53	18	1,066	1,137
Rajcote - - -	10	-	1	11	Kolhapur - - -	8	-	-	8
Bhooj - - -	7	-	-	7	Dharwar - - -	10	-	-	10
Dwarka - - -	1	-	-	1	Aden Field Force :				
Mhow Division :					Aden - - -	54	22	706	782
Mhow - - -	71	17	1,501	1,589					
Indore - - -	7	-	87	94					

No. 3.

STATEMENT showing the Number of EUROPEAN and EURASIAN POPULATION at each STATION under the
BOMBAY PRESIDENCY.

STATION.	EUROPEANS.			EURASIANS.			TOTAL.	STATION.	EUROPEANS.			EURASIANS.			TOTAL.
	Males.	Females.	Children.	Males.	Females.	Children.			Males.	Females.	Children.	Males.	Females.	Children.	
Deesa - - -	30	4	-	-	1	-	45	Bandora - - -	-	92	-	-	-	-	92
Sattara - - -	43	31	-	20	8	-	102	Dapuli - - -	-	-	-	-	-	-	18
Mahableshwur - - -	32	31	-	36	11	-	110	Ratnagiri - - -	-	-	-	-	-	-	31
Surat - - -	-	-	-	-	-	-	145	Puna - - -	-	633	-	-	91	-	754
Ahmedabad - - -	-	-	-	-	-	-	125	Kirkee - - -	-	46	-	-	-	-	46
Ajmere - - -	33	21	9	9	6	13	91	Khandala - - -	-	2	-	-	-	-	2
Nasirabad - - -	21	12	22	-	-	-	55	Poorundhur - - -	-	7	-	-	-	-	7
Oodeypur - - -	4	4	4	-	-	-	12	Baroda - - -	32	20	12	13	20	16	113
Aboo - - -	10	11	66	-	-	2	89	Bombay - - -	-	7,253	-	-	2,352	-	9,605
Sholapur - - -	-	52	-	-	58	-	110	Colaba - - -	-	1,504	-	-	237	-	1,741
Ahmadnagar - - -	-	-	-	-	-	-	89	Byculla - - -	-	495	-	-	293	-	788
Asirgarh - - -	-	138	-	-	30	-	168	Rajkot - - -	-	17	-	-	2	-	19
Belgaum - - -	-	-	-	-	-	-	158	Bhooj - - -	-	5	-	-	-	-	5
Deolalee - - -	-	-	-	-	-	-	3	Kurrachi, Manora, Clifton and Kea- maree. - - -	430	241	-	190	133	-	994
Kaladai - - -	-	8	-	-	7	-	15	Haidarabad - - -	-	-	-	-	-	-	38
Karwar - - -	-	16	-	-	5	-	21	Shikarpur - - -	4	5	-	4	5	-	18
Aden - - -	165	44	-	92	52	-	353	Sukkur - - -	47	26	-	87	30	-	140
Broach - - -	-	28	-	-	2	-	30	Upper Sind Fron- tier. - - -	-	1	-	-	6	-	7
Dharwar - - -	-	-	-	-	-	-	131								
Tanna - - -	-	26	-	-	5	-	31								

No. 4.

STATEMENT showing the Number of each CHURCH of ENGLAND CLERGYMAN, who, not being a Government Chaplain, receives a Portion of his Salary from Government, with Particulars as to the Nature of each Charge, &c.

N A . E.	Salary.		Nature of Charge.	Society.	R E M A R K S.
	Government.	Other Source.			
Rev. T. Corfield - -	Rs. 150	Rs. a. p. 163 - -	Railway Chaplain, Great Indian Peninsula Railway Company, for Egut-poorra, and stations along the line.	Additional clergy of Society for Propagation of the Gospel.	Rs. 1,540 per annum interest of Fund by subscriptions of shareholders of Company.
Rev. C. Gilder - -	150	147 - -	Trinity Church, Sonapur, Bombay District, of Europeans and Eurasians in service of Government and others ; also schools of Indo-British Institution.	Society for Propagation of the Gospel.	Rs. 40. 5 a. 4 p. Endowment Fund for Pastor of Trinity Church, rest of 147 rupees from Society for Propagation of the Gospel.
Rev. H. Harpur - -	200	196 10 8	St. Peter's Church, Mazagon, Bombay District, of Europeans and Eurasians in service of Government and Peninsula and Oriental Company, and other employments. Is also Cemetery Chaplain, and in spiritual charge of the gaols.	Additional Clergy of Society for Propagation of the Gospel.	Rs. 50 extra conveyance allowance from Government for Sewree Cemetery.
Rev. H. Reed - -	150	160 - -	Kotree, Sind, station terminus of Sind Railway and starting point of Indus steamers, Government servants, and others employed in Railway and Flotilla companies.	- - ditto - ditto -	Rs. 80 from each of the companies.

No. 5.

STATEMENT showing the Number of EUROPEAN TROOPS, and of the EUROPEAN, EURASIAN, and AMERICAN CIVIL POPULATION who are MEMBERS of the CHURCH of ENGLAND, or Attendants on its Services; also the Number of the Civil Population who are in the Service of Government, and who are European or British-born Subjects or Americans, and their Families, under each Head, the Number of Women and Children, being separately shown.

[illegible]

No. 6.

STATEMENT showing the Number of EUROPEAN TROOPS of the EUROPEAN, EURASIAN, and AMERICAN CIVIL POPULATION who are Members of the PRESBYTERIAN CHURCH, or are Attendants on its Services; also showing the Number of the Civil Population who are in the Service of Government and who are European or British-born Subjects or American, and their Families.

STATION.	(A.) Number of European Troops with their Wives and Children attending Presbyterian Church Services.				(B.) Number of European, Eurasian, and American Civil Population who are Members of the Presbyterian Church, or Attendants on its Services.				(C.) Number of the Civil Population attending Presbyterian Church Service who are Servants of Government, and of their Families.				(D.) Number out of the Total Civil Population who are European or British-born Subjects or Americans, and of their Families.			
	Men.	Women.	Children.	Total.	Men.	Women.	Children.	Total.	Men.	Women.	Children.	Total.	Men.	Women.	Children.	Total.
Bombay - - - -	61	38	51	150	414	151	234	799	82	40	59	181	62	29	39	130
Puna - - - -	110	15	32	157	30	20	54	104	22	12	11	45	18	5	9	32
Kirkee - - - -	64	11	13	88	None.	-	-	-	-	-	-	-	-	-	-	-
Kurrachi* - - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Belgaum - - - -	51	-	-	69	5	18	-	23	2	9	-	11	2	-	-	11

* The Senior Chaplain, Church of Scotland, gives the total number of Presbyterians at Kurrachi, including the military and civil, at 312 men, 53 women, 113 children—total, 478. He adds, "As the Chaplain at Kurrachi died in November 1871, and the vacancy has not yet been filled up, I have been obliged to take these from the returns last furnished by the Rev. Mr. Middleton.

No. 7.

STATEMENT of ROMAN CATHOLIC PRIESTS who are paid in the MILITARY DEPARTMENT of the BOMBAY PRESIDENCY.

STATION.	Name of the Priest.	Monthly Pay.	Monthly Allowance for Lighting, and other Expenses.	Monthly Allowance for Out-post Lighting, &c.	Monthly Travelling Expenses.	Monthly Chapel Rent.	Monthly Horse Allowance.	Monthly Percentage for Dearness of Grain.	REMARKS.
		Rs.	Rs.	Rs.	Rs.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
Ahmednagar -	G. Miller -	200	23	-	-	-	-	-	(a) For Steamer Point, 10 rupees. For Isthmus.
Aden - - -	F. L. D. Gonzaga	200	23	(a) 20	(b) 75	-	*30 - -	-	(b) To and from Steamer Point.
Ahmedabad -	P. F. D'Oliveira	150	23	-	-	-	-	-	* Government Resolution, No. 3239 of 24th July 1872.
Belgaum - -	P. W. Adams -	200	23	-	-	-	-	-	
Colaba, Bombay -	B. Hafely -	200	23	-	-	-	-	-	
Deesa - - -	P. Salinger -	200	23	-	(c) 50	-	-	10 - -	(c) To and from Abco.
Deolalee - -	D. F. Pereira -	150	23	-	-	-	-	7 8 -	Debited to Government of India.
Haidarabad -	J. Nuckel -	150	23	-	-	-	-	-	
Kirkee - - -	G. Wenniger -	150	23	-	-	-	-	-	
Kurrachi - -	G. T. Bridges -	150	23	-	-	-	-	-	(d) For Indore.
Mhow - - -	F. Polycarp -	200	23	(d) 10	(e) 50	+32 4 -	-	-	(e) To and from Indore.
	F. Odorick -	150							+ Government Resolution, No. 3189 of 10th September 1860.
Neemuch - -	J. Doogan -	150	23	-	-	-	‡30 - -	-	‡ Government Resolution, No. 4490 of 27th October 1871.
Nasirabad -	F. Paul - -	150	23	-	-	-	-	-	(f) For Poorundhur.
Puna - - -	H. Depelchin -	200	23	(f) 10	(g) 25	-	-	-	(g) Eight annas a mile to and from Poorundhur.
	W. Althoff -	150							
Sattara - - -	J. B. M. D'Souza	150	23	-	-	§25 - -	-	-	§ Government Resolution, No. 196 of 9th August 1867.

Note.—Pay to priests on 200 rupees and 150 rupees is admitted under paras. 2, 3, 5, 6 and 7 of G. G. O. No. 462 of 1871.

Travelling allowance is admitted under paras. 22 and 23 of G. G. O. No. 462 of 1871

Lighting allowance 23 rupees per month for each station, vide para. 30 of 1871.

Ditto - ditto 10 rupees per month for each out-post, vide para. 31 of 1871.

Percentage for dearness of grain admitted under Government Resolution of 19th October 1864, No. 134, Ecclesiastical Department.

(Ecclesiastical—March 1876.)

No. 287 V. S., dated Calcutta, the 10th July 1873.

From *H. J. S. Cotton*, Esq., Officiating Under Secretary to the Government of Bengal,
to the Secretary to the Government of India.

IN continuation of my letter, No. 88 V. S., dated the 29th May last, I am directed to submit to the Government of India a copy of a Return received from the Reverend Father Accursio, Roman Catholic Chaplain at Darjeeling, showing the number of European troops and civil population at that station, who are Roman Catholics, or attendants on the services of a Roman Catholic Priest.

RETURN showing the Number of EUROPEAN TROOPS and CIVIL POPULATION at the Station of *Darjeeling*, who are ROMAN CATHOLICS, or Attendants on the Services of a Roman Catholic Priest.

(A.) Number of European Troops at the Station of Darjeeling who are Roman Catholics, or Attendants on the Services of a Roman Catholic Priest.		(B.) Number of European, Eurasian, and American Civil Population who are Roman Catholics or Attendants on the Services of a Roman Catholic Priest.		(C.) Number of those in Column (B.) who are in the Service of Government, and their Families.		(D.) Number of those in Column (C.) who are European British-born Subjects or Americans, and their Families.	
TROOPS.	Women and Children belonging to them.	Men.	Women and Children.	Men.	Women and Children.	Men.	Women and Children.
No. 3 Battery, 5th Brigade, Royal Artillery and Con- valescent Depôt. } 56	7	15	107	2	15	1	1
Officers - - - - - 2	1	—	—	—	—	—	—
Commissariat Department - 3	15	—	—	—	—	—	—

N.B.—The number relatively in excess of women and children under Column (B.) is owing to the Loretto School Institution of Darjeeling.

I certify that the above figures are to the best of my knowledge correct.

Darjeeling, 19 June 1873.

F. Accursio,
Roman Catholic Chaplain

(Ecclesiastical—March 1876.)

No. 1857 A., dated Naini Tal, the 25th July 1873.

From C. A. Elliott, Esq., Secretary to the Government of the North Western Provinces, to the Secretary to the Government of India.

IN continuation of my letter, No. 1670 A, dated the 7th July 1873, I am directed to forward, for the information of His Excellency the Viceroy and Governor General in Council, the accompanying amalgamated Statements Nos. 1. and 2., prepared in this office, showing the particulars called for in the letter from your office, No. 385, dated the 2nd November 1872, regarding the charges of Presbyterian Chaplains and Ministers and of Roman Catholic Chaplains and Priests in the North-Western Provinces who are now receiving aid from Government.

2. I am also to forward a separate Statement (No. 3). containing similar informations regarding stations which are not under this Government, but are within the diocese of the Roman Catholic Bishop of Agra.

3. I am to add that the Bishop states that some of the priests addressed on the subject have not as yet submitted their returns, but that as soon as they are received they will be transmitted to Government. A supplementary statement will then be submitted to the Government of India.

No. 1.

STATEMENT showing the Particulars called for by the Government of India regarding the Charges of PRESBYTERIAN CHAPLAINS and PRESBYTERIAN MINISTERS now receiving Aid from Government.

1. STATION.	2. Number of European Troops who are Presbyterians or Attendants on the Presbyterian Services, and of the Women and Children belonging to them.			3. Total Number of European, Eurasian, and American Civil Population who are Presbyterians or Attendants on Presbyterian Services.			4. Number out of those shown in Column 3 who are in the Service of Government and of their Families.			5. Number out of those shown in Column 4 who are European British-born Subjects or Americans, and of their Families.			6. Nature of Charge.	7. Amount of Aid given.
	Men.	Women.	Children.	Men.	Women.	Children.	Men.	Women.	Children.	Men.	Women.	Children.		
Chuckrata - - -	824	71	137	7	7	11	7	7	11	6	7	11	Charge held by Assistant Chaplains of the 92nd Highlanders.	Rs. a. p. *500 - -
Meerut† - - -	70	12	19	18	18	33	11	11	15	10	8	14	Charge held by a Minister of the Church of Scotland, Additional Clergy Society, Bengal.	‡150 - -
Cawnpore - - -	42	2	9	59	24	30	4	4	7	1	-	-	Charge held by a Chaplain of the Church of Scotland.	800 - -
Allahabad - - -	75	14	18	108	100	191	35	34	93	35	34	93		
Morar - - -	327	30	43	1	1	4	1	1	4	1	1	4		
Lucknow - - -	133	23	41	11	10	10	3	2	3	3	2	3		
Benares - - -	26	3	11	5	1	3	-	-	-	-	-	-		

* In addition to this amount Assistant Chaplain draws 75 rupees per mensem for "tentage" so long as he is attached to a regiment.

† During the winter months when families, who resort to the hills for the hot weather and rains, return to the station, the attendance is larger. The Presbyterian Minister states that Delhi, which has 48 Presbyterians, is an out-station of Meerut visited by him, and that Roorkee, where there are 87, might also be included in his charge.

‡ The Colonial Committee of the General Assembly, with the aid of the Church of Scotland Additional Clergy Society, make up the salary of the Meerut Clergyman to 500 rupees per mensem.

No. 2.

STATEMENT showing the Particulars called for by the Government of India regarding the Charges of ROMAN CATHOLIC CHAPLAINS and ROMAN CATHOLIC PRIESTS now receiving Aid from Government.

1. STATION.	2. Number of European Troops who are Roman Catholics or Attendants on the Roman Catholic Services, and of the Women and Children belonging to them.			3. Total Number of European, Eurasian, and American Civil Population who are Roman Catholics or Attendants on Roman Catholic Services.			4. Number out of those shown in Column 3 who are in the Service of Government, and of their Families.			5. Number out of those shown in Column 4 who are European British-born Subjects or Americans, and of their Families.			6. Nature of Charge.	7. Amount of Aid given.
	Men.	Women.	Children.	Men.	Women.	Children.	Men.	Women.	Children.	Men.	Women.	Children.		
Jhansi - - -	174	31	54	5	3	8	4	2	8	2	1	3	Charge held by a Chaplain	Rs. a. p. 150 - -
Chunar - - -	29	9	14	49	64	34	48	-	-	40	-	-	- ditto - ditto -	150 - -
Benares - - -	156	30	60	10	11	12	2	-	-	1	-	-	- ditto - ditto -	150 - -
Meerut:														
As given by Military Authorities, Meerut.	359	66	129	57	49	64	28	22	28	19	13	25	- ditto - ditto -	200 - -
As given by Roman Catholic Chaplain, Meerut.	379	89	148											
Cawnpore - - -	296	38	77	22	22	28	3	3	3	2	3	3	Charge held by a head Chaplain and one assistant Chaplain.	*200 - -
Allahabad - - -	297	50	132	130	136	170	41	44	72	30	32	60	Charge held by a head Chaplain and two assistant Chaplains.	*200 - -
Agra - - -	412	79	134	23	20	39	14	8	19	14	8	19	Charge held by a Chaplain	200 - -
Naini Tal - - -	68	10	20	15	7	8	11	6	8	6	3	8	Charge held by one Chaplain.	200 - -
Ranikhet - - -	151	23	52	6	4	5	6	4	5	3	4	5	- ditto - ditto -	150 - -

* Drawn by the head Chaplain.

Naini Tal, 25 July 1873.

C. A. Elliott, Secretary to the Government, North Western Provinces.

No. 3.

STATEMENT showing certain Particulars regarding the Charges of ROMAN CATHOLIC CHAPLAINS and ROMAN CATHOLIC PRIESTS now receiving Aid from Government at certain Stations not under the Control of the Government of the North Western Provinces.

1. STATION.	2. Number of European Troops who are Roman Catholics or Attendants on the Roman Catholic Services, and of the Women and Children belonging to them.			3. Total Number of European, Eurasian, and American Civil Population who are Roman Catholics or Attendants on Roman Catholic Services.			4. Number out of those shown in Column 3, who are in the Service of Government and of their Families.			5. Number out of those shown in Column 4 who are European British-born Subjects or Americans, and of their Families.			6. Nature of Charge.	7. Amount of Aid given.
	Men.	Women.	Children.	Men.	Women.	Children.	Men.	Women.	Children.	Men.	Women.	Children.		
Ferozepur - - -	371	57	103	14	12	21	9	10	21	6	8	13	Charge held by a Chaplain	Rs. a. p. 200 - -
Nusseerabad - - -	245	42	84	4	2	2	4	2	2	2	2	2	- ditto - ditto -	150 - -
Amballa - - -	170	33	42	7	10	13	6	5	11	3	1	3	- ditto - ditto -	200 - -
Multan - - -	360	48	103	9	7	17	6	4	11	4	3	7	- ditto - ditto -	200 - -
Morar, Gwalior - - -	462	60	85	8	4	5	8	4	5	3	2	4	- ditto - ditto -	200 - -
Peshawar - - -	726	93	186	19	4	4	8	2	4	8	2	4	- ditto - ditto -	200 - -
Nowahera* - - -	211	16	27	1	-	-	1	-	-	1	-	-	- ditto - ditto -	150 - -
Subathoo (Sanitarium) - - -	374	63	110	1	-	8	-	-	-	1	-	8	- ditto - ditto -	150 - -
Jullundur - - -	151	28	33	6	9	22	5	9	22	5	9	22	- ditto - ditto -	200 - -
Delhi - - -	209	30	74	33	29	47	22	22	38	†	-	-	- ditto - ditto -	150 - -
Sialkot - - -	420	59	89	11	19	44	4	9	14	3	3	4	- ditto - ditto -	200 - -
Mhow (Central India) - - -	413	69	106	340	57	83	239	-	-	9	7	11	- ditto - ditto -	200 - -

(*) 257 more Roman Catholics of the 58th Regiment are at the Cherut and Attock out-posts.

† No means of knowing the number of British-born subjects.

Naini Tal, 25 July 1873.

C. A. Elliott, Secretary to the Government, North Western Provinces.

(Ecclesiastical—March 1876.)

No. 3679, dated Lucknow, the 1st August 1873.

From Captain N. M. T. Horsford, Junior Secretary to the Chief Commissioner of Oudh, to the Officiating Under Secretary to the Government of India.

With reference to your letter, No. 387, dated 2nd November last, I am directed to forward the Return therein called for regarding the charges of Chaplains in Oudh.

STATEMENT showing the Particulars called for by the Government of India regarding the Charges of Chaplains in Oudh.

NAME OF STATION.	Number of Chaplains.	Amount received from Government.	(A.) Number of Troops who are Presbyterians or Attendants on Presbyterian Services, and of the Women and Children belonging to them.			(B.) Total Number of European, Eurasian, and American Civil Population, who are Presbyterians or Attendants on Presbyterian Services.			(C.) Number out of the Total (B.) who are in the Service of Government, and of their Families.			(D.) Number out of those shown under (C.) who are European British-born Subjects or Americans, and of their Families.						REMARKS.				
			Men.	Women.	Children.	Total.	Men.	Women.	Children.	Total.	British-born European Subjects.			Americans.								
											Men.	Women.	Children.	Total.	Men.	Women.	Children.		Total.			
Lucknow -	-	Rs. -	133	23	41	197	11	10	10	31	8	3	2	3	8	-	3	2	3	8	This return was made up for the Government, North Western Provinces, by Rev. J. Williamson. He remarks: "The military return is no doubt correct, but I feel confident that the civil returns very much understated the real number in the civil station." A Chaplain visits this station at rare intervals. No information received as to aid given by Government. There are two priests stationed here who receive respectively 200 rupees and 150 rupees per mensem. They have charge of cantonments, military prison in the civil station and the Fort at Machee Bhawan.	
ROMAN CATHOLICS																						
Lucknow -	-	350 per mensem.	748	130	173	1,051	92	155	41	288	14	8	25	47	-	2	1	-	2	1	3	
Fyzabad -	-	150 per mensem.	307	65	72	444	8	11	14	-	-	-	-	-	-	-	-	-	-	-		
Sitapur -	-	150 per mensem.	216	35	70	321	3	3	9	15	3	3	9	15	-	3	3	9	3	3	15	
CHURCH OF ENGLAND.																						
Lucknow, civil -	-	890 per mensem.	87	16	35	138	360	240	200	800	280	-	-	280	260	260	-	260	-	-	260	The figures have been approximately given by the civil Chaplains. The figures under (A.) are the men in the military prison in the civil lines, and in the Fort at Machee Bhawan. The Chaplain visits Rai Bareilly every second month.
Lucknow, cantonments -	-	500	1,713	146	229	2,088	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Fyzabad -	-	800	564	63	74	701	26	20	46	46	16	14	14	30	11	11	11	11	11	22	The Chaplain visits Sultanpur and Per- tabgarh once in four months.	
Sitapur -	-	800	400	37	76	513	4	1	-	5	4	-	-	4	1	1	-	-	-	1		

(Ecclesiastical—March 1876.)

No. 2126 A., dated Naini Tal, the 27th August 1873.

From C. A. Elliott, Esq., Secretary to the Government of the North Western Provinces, to the Secretary to the Government of India.

IN continuation of my letter, No. 1,857 A., dated 25th July, I am directed to forward a statement in the prescribed form, showing the number of Roman Catholics at the stations of Moradabad, Bareilly, Shahjehanpur, Landour, and Chukrata.

STATEMENT showing the Number of ROMAN CATHOLICS at the Stations of Moradabad, Bareilly, Shahjehanpur, Landour, and Chukrata.

STATION.	Number of European Roman Catholic Troops.			Number of European, Eurasian, and American Roman Catholic Civilians.			Number of those shown in Column 3, who are in the Service of Government.			Number of those in Column 4, who are European British-born or American Subjects.			Nature of Charge.	Amount of Aid given by Government.
	Men.	Women.	Children.	Men.	Women.	Children.	Men.	Women.	Children.	Men.	Women.	Children.		
Moradabad -	20 to 30	2	3	1	1	-	1	1	-	1	-	-	Visited by Roman Catholic Chaplain of Bareilly.	Rs. -
Bareilly -	171	22	43	10	5	5	8	4	5	6	3	-	Roman Catholic Chaplain.	200
Shahjehanpur -	43	9	19	5	5	14	5	5	14	11	11	11	Visited by Roman Catholic Chaplain of Bareilly.	-
Landour -	98	3	7	9	4	6	9	4	6	-	-	96*	Roman Catholic Chaplain of Landour.	150
Chukrata -	47	7	8											
TOTAL -	389	43	80	25	15	25	23	14	25	18	14	107		

* School boys.

(Ecclesiastical—March 1876.)

No. 1339—14, dated Rangoon, the 3rd September 1873.

From Major H. T. Duncan, Officiating Secretary to the Chief Commissioner of British Burma, to the Secretary to the Government of India.

REFERRING to your letters marginally noted, I am directed to submit the returns called for, showing the number of European troops, and European, Eurasian, and American civil population, who are members or attendants on the Church of England, or are Presbyterians or Roman Catholics attending the services of these churches under the charge of a minister, chaplain, or priest, receiving aid from Government.

No. 376, dated 2nd November 1872.
No. 389 of the same date.

2. The returns which refer to the civil population are necessarily only approximate, and in the case of those for the town of Rangoon especially so, as the Chaplain of the Church of England in charge has declared his inability to give any assistance in computing the numbers of Europeans who are members of that Church, or who attend his services.

STATEMENT (A.)

NUMBER of CHRISTIANS belonging to the EUROPEAN TROOPS stationed in British Burma.

CHURCH OF ENGLAND.			ROMAN CATHOLICS.			PRESBYTERIANS.			TOTAL.		
Men.	Women.	Children.	Men.	Women.	Children.	Men.	Women.	Children.	Men.	Women.	Children.
1,112	187	328	884	145	324	184	11	23	2,180	343	675
N.B.—Church of England Chaplains									4		
Roman Catholic Chaplains									3		
Presbyterian Ministers									-		
TOTAL									7		

STATEMENT (B.)

NUMBER OF CHRISTIANS, EUROPEANS, EURASIANS, OR AMERICANS belonging to the CIVIL POPULATION OF BRITISH BURMA, under the Charge of CHAPLAINS who receive Remuneration directly or indirectly from Government.

	CHURCH of ENGLAND.			ROMAN CATHOLICS.			PRESBYTERIANS.			TOTAL.		
	Men.	Women.	Children.	Men.	Women.	Children.	Men.	Women.	Children.	Men.	Women.	Children.
Toungoo - - - - -	20	10	17	1	-	1	-	-	-	21	10	18
Moulmein - - - - -	188	196	166	-	-	-	-	-	-	188	196	166
Tavoy - - - - -	5	5	9	-	-	-	-	-	-	5	5	9
Mergui - - - - -	5	1	5	-	-	-	-	-	-	5	1	5
Shwé-gyeen - - - - -	21	9	28	-	-	-	-	-	-	21	9	28
Akyab District - - - - -	79	35	33	-	-	-	-	-	-	79	35	33
Prome District - - - - -	18	5	2	-	-	-	-	-	-	18	5	2
Rangoon District - - - - -	5	2	3	-	-	-	-	-	-	5	2	3
Bassein District - - - - -	26	10	26	-	-	-	-	-	-	26	10	26
Myanung - - - - -	-	-	-	-	-	-	-	-	-	-	-	-
Thayet - - - - -	22	7	10	-	-	-	-	-	-	22	7	10
Rangoon Town - - - - -	100	110	130	-	-	-	-	-	-	100	110	130
Mandalay - - - - -	35	7	12	-	-	-	-	-	-	35	7	12
TOTAL - - - - -	524	397	441	1	-	1	-	-	-	525	397	442

STATEMENT (C.)

NUMBER out of Total (B.) who are in the Service of Government and their Families.

	CHURCH of ENGLAND.			ROMAN CATHOLICS.			PRESBYTERIANS.			TOTAL.		
	Men.	Women.	Children.	Men.	Women.	Children.	Men.	Women.	Children.	Men.	Women.	Children.
Moulmein - - - - -	52	33	70	-	-	-	-	-	-	52	33	70
Tavoy - - - - -	19	5	9	-	-	-	-	-	-	19	5	9
Mergui - - - - -	5	1	5	-	-	-	-	-	-	5	1	5
Shwé-gyeen - - - - -	15	6	24	-	-	-	-	-	-	15	6	24
Toungoo - - - - -	16	8	9	-	-	-	-	-	-	16	8	9
Akyab District - - - - -	55	26	29	-	-	-	-	-	-	55	26	29
Prome District - - - - -	13	5	2	-	-	-	-	-	-	13	5	2
Rangoon District - - - - -	5	2	3	-	-	-	-	-	-	5	2	3
Bassein District - - - - -	14	5	13	-	-	-	-	-	-	14	5	13
Myanung - - - - -	-	-	-	-	-	-	-	-	-	-	-	-
Thayet - - - - -	17	5	9	-	-	-	-	-	-	17	5	9
Rangoon Town - - - - -	50	60	65	-	-	-	-	-	-	50	60	65
Mandalay - - - - -	5	1	-	-	-	-	-	-	-	5	1	-
TOTAL - - - - -	266	137	238	-	-	-	-	-	-	266	137	238

STATEMENT (D.)

NUMBER out of those shown under (C.) who are European British-born Subjects or Americans, and of their Families.

	CHURCH of ENGLAND.			ROMAN CATHOLICS.			PRESBYTERIANS.			TOTAL.		
	Men.	Women.	Children.	Men.	Women.	Children.	Men.	Women.	Children.	Men.	Women.	Children.
Moulmein - - - - -	52	33	70	-	-	-	-	-	-	52	33	70
Tavoy - - - - -	4	3	8	-	-	-	-	-	-	4	3	8
Mergui - - - - -	5	-	5	-	-	-	-	-	-	5	-	5
Shwé-gyeen - - - - -	5	1	-	-	-	-	-	-	-	5	1	-
Toungoo - - - - -	15	8	9	-	-	-	-	-	-	15	8	9
Akyab District - - - - -	44	17	14	-	-	-	-	-	-	44	17	14
Prome District - - - - -	13	5	2	-	-	-	-	-	-	13	5	2
Rangoon District - - - - -	5	2	3	-	-	-	-	-	-	5	2	3
Bassein District - - - - -	8	5	6	-	-	-	-	-	-	8	5	6
Myanung - - - - -	-	-	-	-	-	-	-	-	-	-	-	-
Thayet - - - - -	17	5	9	-	-	-	-	-	-	17	5	9
Rangoon Town - - - - -	50	60	65	-	-	-	-	-	-	50	60	65
Mandalay - - - - -	2	-	-	-	-	-	-	-	-	2	-	-
TOTAL - - - - -	220	159	191	-	-	-	-	-	-	220	159	191

(Ecclesiastical—March 1876.)

No. 4103, dated Lahore, the 3rd November 1873.

From T. H. Thornton, Esq., D.C.L., Secretary to the Government of the Punjab, to the Secretary to the Government of India.

I AM desired by the Honourable the Lieutenant Governor to forward the two accompanying statements which contain all the information that has been collected with regard to the number of Presbyterians and Roman Catholics, &c., in the Province, called for in your letter of the 2nd November 1872, No. 386.

2. These returns are doubtless not very complete, but as they contain all the information which district officers can apparently supply, his Honour was unwilling to delay further in giving a reply on the subject.

3. I am to express regret for the delay which has occurred in replying to your letter; the delay is due to replies not being received from several district officers.

STATEMENT showing the Information called for in Home Department Circular No. 386, dated the 2nd November 1872, as regards PRESBYTERIANS.

DIVISION.	DISTRICT.	(A.) Number of European Troops who are Presbyterians or Attendants on the Presbyterian Services, and of the Women and Children belonging to them.				(B.) Total Number of European, Eurasian, and American Civil Population, who are Presbyterians or Attendants on Presbyterian Services.				(C.) Number out of the Total (B.) who are in the Service of the Government, and of their Families.				(D.) Number out of those shown under (C.) who are European British-born Subjects or Americans, and their Families.				REMARKS.
		Men.	Women.	Children.	Total.	Men.	Women.	Children.	Total.	Men.	Women.	Children.	Total.	Men.	Women.	Children.	Total.	
Delhi	Delhi	69	21	-	81	-	-	-	-	-	-	-	-	-	-	-	-	There is no Presbyterian Chaplain at this station; the Baptist Missionary provides services for the Presbyterians.
	Gurgaon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Hissar	Karnaul	-	-	-	-	23	15	19	57	23	15	19	57	20	11	19	50	There is no Presbyterian Chaplain stationed in this division. This return shows the military population as it stood on 1st January 1873, and the civil population as it stood on 1st March 1873. In the civil returns the residents of the Umballa civil station are included. There is no Presbyterian minister, not being a Chaplain, who receives any portion of his remuneration from Government.
	Hissar	-	-	-	-	1	-	-	1	1	-	-	1	1	-	-	1	
	Rohtak	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Sirsa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Umballa	Umballa	586	73	120	779	33	24	19	76	22	9	11	42	16	5	7	28	There are at present one American, one English, and one German Missionary at Ludhiana; none are in the service of Government, and none receiving remuneration from Government directly or indirectly.
	Ludhiana	-	-	-	-	-	4	4	8	-	-	-	-	-	-	-	-	
Jullundur	Simla	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	There being no Presbyterian chapel, all attend the service of the Church of England.
	Jullundur	45	7	12	64	1	1	-	2	-	-	-	-	-	-	-	-	
	Hushiarpur	-	-	-	-	-	4	-	4	-	-	-	-	-	-	-	-	
	Kangra	6	-	-	6	5	-	-	5	-	-	-	-	-	-	-	-	
Amritsar	Amritsar	23	2	2	27	2	3	2	7	1	2	2	5	1	2	2	5	Presbyterians are included in the number of those who attend the service of the Church of England.
	Gurdaspur	12	2	4	18	3	3	5	11	2	-	2	4	1	1	1	3	
	Sialkot	105	8	14	127	3	2	-	5	3	2	-	5	3	2	-	5	
	Lahore	90	10	16	116	2	-	-	2	-	-	-	-	-	-	-	-	
Lahore	Gujranwala	-	-	-	-	10	5	10	25	-	-	-	-	-	-	-	-	No Presbyterian Chaplains holding charges or receiving aid from Government.
	Ferozepore	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Rawal Pindi	111	8	13	132	8	-	-	8	1	-	-	1	1	-	-	1	
	Jhelum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Rawal Pindi	Gujrat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Presbyterians are included in the number of those who attend the service of the Church of England.
	Shahpur	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Mooltan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Jhang	-	-	-	-	1	1	2	4	1	1	2	4	1	1	2	4	
Mooltan	Montgomery	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No Presbyterian Chaplains holding charges or receiving aid from Government.
	Mozuffergarh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Dera Ismail Khan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Dera Ghazi Khan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Derajat	Bannu	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Presbyterians are included in the number of those who attend the service of the Church of England.
	Peshawar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Hazara	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Kohat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		1,098	131	181	1,350	92	62	61	215	54	29	34	117	44	22	31	97	

E. W. Trotter,
Assistant Secretary to the Government of the Punjab

STATEMENT showing the Information called for in Home Department Circular No. 386, dated 2nd November 1872,
as regards ROMAN CATHOLICS.

DIVISION.	DISTRICT.	(A.) Number of European Troops who are Roman Catholic Attendants on the Roman Catholic Services, and of the Women and Children belonging to them.				(B.) Total Number of European, Eurasian, and American Civil Population who are Roman Catholics or Attendants on Roman Catholic Services.				(C.) Number out of the Total (B) who are in the Service of the Government and of their Families.				(D.) Number of those shown under (C.) who are European British-born Subjects or Americans, and of their Families.				REMARKS.
		Men.	Women.	Children.	Total.	Men.	Women.	Children.	Total.	Men.	Women.	Children.	Total.	Men.	Women.	Children.	Total.	
Delhi - -	Delhi - - -	175	25	61	261	33	29	47	109	22	7	9	38	-	-	-	-	There is a Roman Catholic Chaplain receiving remuneration from Government. He is unable to say how many of those shown under (C.) are European British subjects.
	Gurgaon - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Karnaul - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Hissar - -	Hissar - - -	-	-	-	-	2	2	4	8	2	2	4	8	2	2	4	8	There is no Roman Catholic Chaplain or Priest in this division.
	Rohtak - - -	-	-	-	-	1	1	2	4	1	1	2	4	1	1	2	4	
	Sirsa - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Umballa - -	Umballa - - -	160	40	40	240	7	9	21	37	6	8	17	31	5	7	15	27	There is no Roman Catholic Priest, not being a Chaplain, who receives any portion of his remuneration from Government. There is no Roman Catholic Chaplain or Priest here. There is no Roman Catholic Chaplain in Simla receiving any remuneration from Government.
	Ludhiana - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Simla - - -	840	142	229	1,211	5	1	4	10	5	1	4	10	5	1	4	10	
Jullundur - -	Jullundur - - -	142	22	24	188	6	9	-	15	5	9	-	14	5	9	-	14	The Chaplain receives his remuneration directly from Government. The Roman Catholic Chaplain from Jullundur pays a visit periodically.
	Hushiarpur - -	-	-	-	-	2	3	9	14	2	3	9	14	2	2	4	8	
	Kangra - - -	10	2	2	14	2	1	1	4	1	-	-	1	1	-	-	1	
Amritsar - -	Amritsar - - -	68	8	8	84	1	1	-	2	1	1	-	2	1	1	-	2	
	Gurdaspur - -	35	-	-	35	5	4	8	17	4	-	-	4	2	-	-	2	
	Sialkot - - -	467	55	123	645	1	-	-	1	1	-	-	1	1	-	-	1	
Lahore - -	Lahore - - -	363	54	85	502	93	59	58	210	58	35	25	118	25	14	14	53	
	Ferozepore - -	150	70	60	280	-	-	-	-	-	-	-	-	-	-	-	-	
	Gujranwala - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Rawal Pindi -	Rawal Pindi - -	690	69	111	870	1	-	7	8	1	-	7	8	1	-	7	8	
	Jhelam - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Gujrat - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Mooltan - -	Shahpur - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Mooltan - - -	360	48	103	511	9	7	17	33	6	4	11	21	4	3	7	14	
	Jhang - - -	-	-	-	-	1	1	2	4	1	1	2	4	1	1	2	4	
Derajat - -	Montgomery - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No Roman Catholic Chaplain holding charge or receiving aid from Government.
	Mozaffargarh - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Dera Ismail Khan -	50	-	-	50	-	-	-	-	-	-	-	-	-	-	-	-	
Peshawar - -	Dera Ghazi Khan -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Bannu - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Peshawar - - -	780	99	186	1,065	-	-	-	-	12	8	21	41	2	1	-	3	
Kohat - - -	Hazara - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Kohat - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	- - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		4,290	634	1,032	5,956	169	127	180	476	128	80	111	319	58	42	59	159	

E. W. Trotter,
Assistant Secretary to the Government of the Punjab.

EAST INDIA (NUMBER OF CHRISTIANS, &c.).

COPY of the RETURNS furnished by the Local Authorities in *India*, as to Number of CHRISTIANS of different Persuasions in the different CONGREGATIONS; SALARIES of MINISTERS of RELIGION ministering to them, &c.; in reply to the Circular of the Central Government, laid before Parliament last Year.

(*Mr. O'Reilly.*)

*Ordered, by The House of Commons, to be Printed,
15 February 1877.*

229

COUNCIL OF ARBITRATION
(IMPERIAL AND INDIAN GOVERNMENT ACCOUNTS).

RETURN to an Order of the Honourable The House of Commons,
dated 14 August 1877;—for,

COPY “ of CORRESPONDENCE upon the Subject of establishing a COUNCIL
OF ARBITRATION to decide Disputed Questions of Account between the
IMPERIAL and INDIAN GOVERNMENTS.”

Sir,

India Office, 2 August 1877.

I FORWARD for your consideration the accompanying copy of a Resolution, adopted by me in Council on the 1st of August, relative to the disposal of claims preferred against the revenues of India by other departments of the Imperial Government, on account of contributions towards services in which India is to a greater or less degree interested.

Should you concur in the course suggested in the Resolution, I am desirous that before any questions are submitted to the arbitrament of the proposed tribunal, it should be clearly understood by both parties to such references that the decisions of the tribunal are to be regarded as absolutely final.

The Right Honourable
the Chancellor of the Exchequer.

I have, &c.
(signed) *Salisbury.*

At a Meeting of the Secretary of State for India in Council, held 1st August
1877, it was resolved,

That in cases where the Secretary of State in Council and any other department of the Imperial Government are unable to agree respecting claims for payment made by one department on another, the Secretary of State in Council will be prepared, if the Imperial Treasury is also willing, to accept thereupon the decision of a Committee of the Privy Council of five, constituted as follows :—

One Member to be nominated on the recommendation of the Chancellor of the Exchequer.

One on that of the Secretary of State for India in Council.

Three, of whom at least one should be a Member of the Judicial Committee, on the recommendation of the Lord Chancellor.

The above Resolution to be valid until the end of the year 1879, after which the Council reserves to itself the discretion of renewing or modifying the same.

(12,904.)

Sir,

Treasury Chambers, 7 August 1877.

I AM directed by the Lords Commissioners of Her Majesty's Treasury to request that you will lay before the Secretary of State for War the enclosed copy of a letter addressed by the Secretary of State for India in Council on the 2nd August to the Chancellor of the Exchequer, and likewise a copy of the Resolution which accompanied that letter on the subject of the disposal of claims preferred against the revenues of India by any departments of the Imperial Government.

CORRESPONDENCE:—COUNCIL OF ARBITRATION.

I am to state that my Lords are prepared to concur, if Mr. Hardy sees no objection, with the Marquis of Salisbury in referring all questions at issue as to such claims to the Committee of five, constituted of Members of the Privy Council, in the mode suggested by his Lordship.

I am, &c.

The Under Secretary of State, (signed) Chas. W. Stronge,
War Office. pro Sec.

Similar Letter sent to the Foreign Office.

COUNCIL OF ARBITRATION
(IMPERIAL AND INDIAN GOVERN-
MENT ACCOUNTS).

COPY of CORRESPONDENCE upon the Subject of
establishing a COUNCIL OF ARBITRATION to
decide Disputed Questions of Account between
the IMPERIAL and INDIAN GOVERNMENTS.

(Mr. Stanley.)

Ordered, by The House of Commons, to be Printed,
14 August 1877.

RETURN to an Address of the Honourable The House of Commons,
dated 10 May 1877;—for,

“ RETURN of the NAMES of the MEMBERS of the COUNCIL of INDIA, with Dates of Appointment according to Seniority; stating in Succession to whom Appointed, and Ages last Birthday; whether having Served or Resided any time in *India*, and, if in the Service, in what Branch, and from and to what Dates; the Annual Amount of any Pay, Pension, Civil Fund, or other Allowance now received for such Indian Service; the Salary and Allowance received as Member of the Council; the Total Annual Receipt of each from the Indian Treasury :”

“ Similar RETURN of the Secretaries of the several Correspondence Departments, and of the Accountant, Director General of Stores, Government Directors of Indian Railways and of Indian Canals and Irrigation Companies, Director of Military Funds, Registrar of the Registry and Despatch Department, Reporter on the Products of India, &c., Geographer, Librarian, and Auditor of the Accounts of the Secretary of State in Council :”

“ And, RETURN of the different Committees the Council is divided into, and of the Names of the Members of each Committee, with the Dates of their Appointment thereto (in continuation of Parliamentary Paper, ‘ East India Council,’ No. 111, of Session 1869).”

India Office, }
29 May 1877. }

LOUIS MALLET,
Under Secretary of State.

(*Mr. Mitchell Henry.*)

Ordered, by The House of Commons, to be Printed,
7 June 1877.

RETURN of the NAMES of the MEMBERS of the COUNCIL of INDIA, with Dates of Appointment according to Seniority; stating in Succession to whom Appointed, and Ages last Birthday; whether having Served or Resided any time in *India*, and, if in the Service, in what Branch, and from and to what Dates; the Annual Amount of any Pay, Pension, Civil Fund, or other Allowance now received for such Indian Service; the Salary and Allowance received as Member of the Council; the Total Annual Receipt of each from the Indian Treasury.

NAMES.	Date of Appointment.	Appointed in Succession to—	Age last Birthday.	Period of Service or Residence in India; Branch of Service, &c.	Annual Amount of Pay, Pension, Civil Fund, or other Allowance for Indian Service.	Salary and Allowance as Member of Council.	Total Annual Receipt from the Indian Treasury.
Sir Thomas Erskine Perry, Knt.	11 August 1859	Major General Sir Henry Creswicke Rawlinson, K.C.B.	70	1841 to 1852, as Puisne Judge and Chief Justice of the Supreme Court at Bombay.	£. s. d. 1,600 - - (Pension of Chief Justice of Bombay.)	£. s. d. 1,200 - -	£. s. d. 2,800 - -
Sir Robert Montgomery, G.C.S.I., K.C.B.	21 September 1868	William Joseph Eastwick, Esq.	66	1827 to 1865, in the Bengal Civil Service.	1,000 - - (Civil Service Annuity.)	1,200 - -	2,200 - -
Sir Frederic James Halliday, K.C.B.	30 "	Charles Mills, Esq.	70	1825 to 1859, in the Bengal Civil Service.	1,000 - - (Civil Service Annuity.)	1,200 - -	2,200 - -
Major General Sir Henry Creswicke Rawlinson, K.C.B., LL.D., D.C.L.	Director of the East India Company, 10 April 1856. Member of Council 2 September 1858 to 5 May 1859; re-appointed 9 October 1868.	Colonel Sir Proby Thomas Cantley, K.C.B.	67	1826 to 1856, in the Bombay Army.	365 - - (Retired Pay.)	1,200 - -	1,565 - -
Sir Henry James Sumner Maine, K.C.S.I., D.C.L.	2 November 1871	Elliot Macnaghten, Esq.	54	1862 to 1869, as Legal Member of the Council of the Governor General.	- - -	1,200 - -	1,200 - -

Andrew Cassels, Esq.	30 April 1874	-	Henry Thoby Prinsep, Esq.	55	Resided, from 1843 to 1851.	-	-	-	1,200	-	1,200	-
Lieutenant General Richard Strachey, R.E., C.S.I., F.R.S.	5 January 1875	-	General Sir Robert John Hussey Vivian, G.C.B.	59	1836 to 1875, in the Bengal Engineers.	456 5 - (Retired Pay.) 100 - - (Good Service Pension.)	1,200	-	1,758	5	-	-
The Honourable Edmund Drummond	9 February "	-	William Urquhart Arbuth- not, Esq.	56	1831 to 1866, in the Bengal Civil Ser- vice.	1,000 - - (Civil Service Annuity.)	1,200	-	2,200	-	-	-
Sir Barrow Helbert Ellis, K.C.S.I.	14 July "	-	Sir George Campbell, K.C.S.I.	4	1842 to 1875, in the Bombay Civil Ser- vice.	1,000 - - (Civil Service Annuity.)	1,200	-	2,200	-	-	-
Colonel Henry Yule, R.E., C.B.	23 October "	-	Sir Frederick Currie, Bart.	57	1838 to 1862, in the Bengal Engineers.	202 5 5 (Retired Pay.)	1,200	-	1,402	5	5	-
Major General Sir Alfred Thomas Wilde, K.C.B., C.S.I.	1 January 1876	-	Lieutenant General Sir Wil- liam Erskine Baker, K.C.B.	56	1838 to 1876, in the Madras Army.	456 5 - (Retired Pay.) 668 12 5 (Colonel's Allowance.)	1,200	-	2,324	17	5	-
Major General Sir Garnet Joseph Wolseley, G.C.M.G., K.C.B.	13 November "	-	Sir Henry Conyngham Montgomery, Bart.	43	1852 to 1853, and 1857 to 1860, in Her Ma- jesty's British Army.	- - -	1,200	-	1,200	-	-	-
Sir William Muir, K.C.S.I., LL.D.	28 "	-	Sir George Russell Clerk, G.C.S.I., K.C.B.	58	1837 to 1876, in the Bengal Civil Ser- vice.	1,000 - - (Civil Service Annuity.)	1,200	-	2,200	-	-	-
Robert Staunton Ellis, Esq., C.B.	17 April 1877	-	Major General Sir Edwin Beaumont Johnson, K.C.B.	52	1844 to 1877, in the Madras Civil Ser- vice.	1,000 - - (Civil Service Annuity.)	1,200	-	2,200	-	-	-

RETURN of the Secretaries of the several Correspondence Departments, and of the Accountant, Director General of Stores, Government Directors of Indian Railways and of Indian Canals and Irrigation Companies, Director of Military Funds, Registrar of the Registry and Despatch Department, Reporter on the Products of India, &c., Geographer, Librarian, and Auditor of the Accounts of the Secretary of State in Council.

NAMES.	Date of Appointment.		Appointed in Succession to.	Age last Birthday.	Period of Service in India: Branch of Service, &c.	Annual Amount of Pay, Pension, Civil Fund, or other Allowance for Indian Service.	Salary and Allowance of Office.	Total Annual Receipt from the Indian Treasury.
	To Indian Home Service.	To present Office.						
SECRETARY OF THE FINANCIAL DEPARTMENT: Thomas Lawrence Secombe, Esq., C.B., Assistant Under Secretary of State.	28 Jan. 1829	Secretary Financial Department, 14 February 1860. Assistant Under Secretary of State, 11 July 1872.	James Cosmo Melvill, Esq.	64	-	-	£. - 1,200 - Personal Al- 500 lowance.	£. s. d. 1,700 - -
SECRETARY OF THE PUBLIC WORKS DEPARTMENT: William Thomas Thornton, Esq., C.B.	2 Aug. 1836 -	29 September 1858	Newly-created appointment on the first organisation of the Secretary of State's Office, with which was incorporated the (previously separate) Railway and Telegraph Departments in 1861.	64	-	-	Salary - 1,200 Salary as Government Director of the Madras Irrigation and Canal Company. Personal Al- 100 lowance.	1,400 - -
SECRETARY OF THE REVENUE, JUDICIAL, AND PUBLIC DEPARTMENT: Sir Henry Lacon Anderson, K.C.S.I.	1 Feb. 1866 -	Secretary, Judicial Department, 1 February 1866.	John Abraham F. Hawkins, Esq. [With the Judicial Department was incorporated the (previously separate) Public Department in 1867, and Revenue Department in 1871.]	60	1840 to 1865 in the Bombay Civil Service.	1,000 l. (Civil Service Annuity.)	- - 1,200	2,200 - -

244. SECRETARY OF THE STATISTICS
AND COMMERCE DEPARTMENT:

Henry Waterfield, Esq. -

SECRETARY OF THE POLITICAL
AND SECRET DEPARTMENT:

Lieutenant Colonel Owen
Tudor Burne, C.S.I.
(Adolphus Warburton
Moore, Esq., Assistant
in the Political and
Secret Department, is
acting as Secretary.)

SECRETARY OF THE MILITARY
DEPARTMENT:

Colonel Allen Bayard Johnson

ACCOUNTANT:

Thomas William Keith, Esq. -

DIRECTOR GENERAL OF STORES:

The Honourable Gerald
Chetwynd Talbot.

GOVERNMENT DIRECTOR OF
GUARANTEED INDIAN RAILWAY
COMPANIES:

Juland Danvers, Esq. -

GOVERNMENT DIRECTOR OF THE
MADRAS IRRIGATION AND
CANAL COMPANY:

William Thomas Thornton,
Esq., C.B.

1 Sept. 1853	16 April 1874	Newly-created appointment.	39	-	-	-	-	-	1,200	-
1 Aug. 1872	16 October 1874	Sir John William Kaye, K.C.S.I.	*	-	-	-	-	Salary of Office - 1,200	*	-
18 Jan. 1877	18 January 1877	Major General Sir Thomas Townsend Pears, K.C.B.	48	1846 to 1877, in the Bengal Army.	365 L. (Pay of unem- ployed Lieutenant Colonel).	-	-	-	1,200	1,565
20 Aug. 1845	1 January 1872	William G. Goodliffe, Esq., Accountant Ge- neral.	48	-	-	-	-	Salary - 1,000 Salary as Clerk to the Widows' Fund of Home Service - 100 Personal Al- lowance - 50	1,150	-
2 Sept. 1858	12 January 1860	Major General John George Bonner.	57	1856 to 1858, as Private Secre- tary to the Governor Ge- neral.	-	-	-	Salary - 1,200 Personal Al- lowance - 200	1,400	-
22 Mar. 1842	1 August 1861	Sir James Cosmo Melvill, K.C.B.	51	-	-	-	-	Salary - 1,200 Personal Al- lowance - 480	1,680	-

See above as Secretary of the Public Works Department.

* Particulars cannot be given, owing to Colonel Burne's absence on duty in India.

Return of the Secretaries of the several Correspondence Departments, and of the Accountant, Director General of Stores, Government Directors of Indian Railways, &c.—continued.

NAMES.	Date of Appointment.		Appointed in Succession to—	Age last Birthday.	Period of Service in India; Branch of Service, &c.	Annual Amount of Pay, Pension, Civil Fund, or other Allowance for Indian Service.	Salary and Allowance of Office.	Total Annual Receipt from the Indian Treasury.
	To Indian Home Service.	To present Office.						
DIRECTOR OF MILITARY FUNDS: Thomas Lawrence Seccombe, Esq., C.B.	See page 4, as Secretary of the Financial Department.							£. s. d.
REGISTRAR: Frank Thompson, Esq., -	24 Jan. 1838	16 October 1874 -	William Astell Franks, Esq.	55	-	-	Salary - 700 Personal Allowance - 100	800 - -
REPORTER ON THE PRODUCTS OF INDIA AND DIRECTOR OF THE INDIA MUSEUM: John Forbes Watson, Esq., M.D., M.A., LL.D.	13 Nov. 1858	Reporter on Products 13 November 1858; also, Director of the India Museum, 29 September 1867.	Dr. John Forbes Royle	49	1850 to 1858, in the Bombay Medical Service.	-	Salary - 600 Personal Allowance - 200	800 - -
GEOGRAPHER: Clements Robert Markham, Esq., C.B., F.R.S. (Assistant in the Revenue Department in charge of the Geographical Correspondence.)	14 July 1854	25 June 1867 -	Duties of Geographer entrusted to Mr. Markham on retirement of Mr. John Walker.	46	-	-	Salary - 900 Personal Allowance - 100	1,000 - -
LIBRARIAN: Reinhold Rost, Esq., LL.D., Ph. D.	1 July 1869	1 July 1869 -	Dr. Fitz-Edward Hall -	55	-	-	Salary - 500 Personal Allowance - 100	600 - -
AUDITOR OF THE ACCOUNTS OF THE SECRETARY STATE IN COUNCIL: Walter Carew Cocks, Esq., -	1 Aug. 1874	1 August 1874 -	Sir Charles Jackson, Knt.	53	-	-	Salary - 1,000	1,000 - -

RETURN of the different COMMITTEES of the COUNCIL of INDIA, 1876-77.

(Appointed 1st November 1876.)

FINANCE.

Honourable Edmund Drummond.
Andrew Cassels, Esq.
Sir Frederic James Halliday, K.C.B.
Lieutenant General Richard Strachey, C.S.I.
Major General Sir Garnet Joseph Wolseley, G.C.M.G., K.C.B.*

JUDICIAL AND PUBLIC.

Sir Thomas Erskine Perry, Knight.
Sir Barrow Helbert Ellis, K.C.S.I.
Robert Staunton Ellis, Esq., C.B.†
Sir Frederic James Halliday, K.C.B.
Sir Henry James Sumner Maine, K.C.S.I.
Sir William Muir, K.C.S.I.‡

MILITARY.

Major General Sir Alfred Thomas Wilde, K.C.B., C.S.I.
Sir Robert Montgomery, G.C.S.I., K.C.B.
Major General Sir Henry Creswicke Rawlinson, K.C.B.
Major General Sir Garnet Joseph Wolseley, G.C.M.G., K.C.B.*
Colonel Henry Yule, C.B.

POLITICAL.

Sir Henry James Sumner Maine, K.C.S.I.
Sir Frederic James Halliday, K.C.B.
Sir Robert Montgomery, G.C.S.I., K.C.B.
Sir Thomas Erskine Perry, Knight.
Major General Sir Henry Creswicke Rawlinson, K.C.B.

PUBLIC WORKS AND RAILWAYS.

Lieutenant General Richard Strachey, C.S.I.
Andrew Cassels, Esq.
Sir Barrow Helbert Ellis, K.C.S.I.
Sir William Muir, K.C.S.I.‡
Colonel Henry Yule, C.B.

REVENUE.

Sir Frederic James Halliday, K.C.B.
Sir Barrow Helbert Ellis, K.C.S.I.
Robert Staunton Ellis, Esq., C.B.†
Sir Henry James Sumner Maine, K.C.S.I.
Sir William Muir, K.C.S.I.‡
Sir Thomas Erskine Perry, Knight.

STATISTICS AND COMMERCE.

Andrew Cassels, Esq.
Honourable Edmund Drummond.
Sir Barrow Helbert Ellis, K.C.S.I.
Lieutenant General Richard Strachey, C.S.I.
Colonel Henry Yule, C.B.

STORES.

Andrew Cassels, Esq.
Honourable Edmund Drummond.
Lieutenant General Richard Strachey, C.S.I.
Major General Sir Alfred Thomas Wilde, K.C.B., C.S.I.

*Appointed 13th November 1876. †Appointed 17th April 1877. ‡Appointed 28th November 1876.

Henry Waterfield,
Secretary,
Statistics and Commerce Department.

EAST INDIA COUNCIL.

RETURN of the NAMES of the MEMBERS of the Council of INDIA, with Dates of Appointment according to Seniority; stating in Succession to whom Appointed, and Ages last Birthday; whether having Served or Resided any time in India; the Annual Amount of their Pay, Pension, Civil Fund, or other Allowance now received for such Indian Service; the Salary and Allowance received as Member of the Council; the Total Annual Receipt of each from the Indian Treasury; and, similar Returns of the Secretaries of the several Correspondence Departments; &c.

(*Mr. Mitchell Henry.*)

*Ordered, by The House of Commons, to be Printed,
7 June 1877.*

CHART OF THE
STORM WAVE INUNDATION.

NOV 9 1876

DACCA

Nirangpur

Dowdabandi

Coatloah

Almashed

Changquij

Old Road

Old Road

Old Road

Old Road

Old Road

Old Road

Old Road

Old Road

Old Road

Old Road

Old Road

Old Road

Old Road

Old Road

Old Road

Old Road

Old Road

Old Road

Old Road

Old Road

Old Road

Old Road

Old Road

Old Road

Old Road

Old Road

Old Road

Area of fresh water inundation colored Green
Do Salt Do Blue
Track of Vortex marked by Parallel lines
Depth of inundation given in feet



P A P E R S

ON THE SUBJECT OF

THE BENGAL CYCLONE AND STORM-WAVE

OF THE

31st October — 1st November 1876;

AND

THE SUBSEQUENT CHOLERA EPIDEMIC.

Presented to both Houses of Parliament by Command of Her Majesty.



LONDON:

PRINTED BY GEORGE EDWARD EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.

FOR HER MAJESTY'S STATIONERY OFFICE.

1877.

CONTENTS.

Date.	From.	To.	Subject.	Page.
1876.				
24th November	Government of India	Secretary of State -	Transmitting copy of telegram regarding mortality from storm-wave.	1
17th November	President in Council -	- - - -	Telegram referred to - - - -	1
24th November	Government of India	Secretary of State -	Transmitting copy of Sir R. Temple's minute on his visit to affected districts	1
22nd November	Government of Bengal	Government of India	Ditto ditto - - - -	2
21st November	Lieutenant-Governor of Bengal.	- - - -	Minute referred to - - - -	2
			Estimate of number of persons drowned.	7
24th November	Government of India	Government of Bengal	Acknowledging minute and conveying thanks to the various authorities for their relief of sufferers.	7
1st December	Ditto - - - -	Secretary of State -	Report of Dacca Commissioner on the District of Backergunge.	9
27th November -	Government of Bengal	Government of India	Transmission of above report -	9
19th November -	Officiating Commissioner Dacca Division.	Government of Bengal	Report on visit to Backergunge district.	9
8th December -	Government of India	Secretary of State -	Chittagong Commissioner's report on his visit to Chittagong district.	14
4th December -	Government of Bengal	Government of India	Transmitting above report - -	15
23rd November -	Officiating Commissioner of Chittagong Division.	Government of Bengal	Submitting report referred to -	15
15th December -	Government of India	Secretary of State -	Further report by Chittagong Commissioner on Noakholly district.	19
7th December -	Government of Bengal	Government of India	Ditto ditto - - - -	20
23rd November -	Officiating Commissioner of Chittagong Division.	Government of Bengal	Submitting report referred to -	20
1877.				
12th January -	Government of India	Secretary of State -	Further minute by Lieut.-Governor of Bengal on effects of cyclone in Sundeeep group of islands.	22
18th December - (1876).	Government of Bengal	Government of India	Ditto ditto - - - -	22
15th December - (1876).	Lieutenant-Governor of Bengal.	- - - -	Minute referred to - - - -	22
12th April -	Government of India	Secretary of State -	Report of Bengal Government Meteorological Reporter on cyclone and storm-wave.	24
	J. Elliott, Esq., Meteorological Reporter to the Government of Bombay.	- - - -	Report on the cyclone and storm-wave.	25
			Introductory chapter—Cyclone Theories. Chapter I. (Not printed.)	26
			„ II. Meteorology of N. India and Bay of Bengal, from 10th to 31st October.	28
			„ III. Path of cyclone in Bay of Bengal.	35
			„ IV. Progress of cyclone over Eastern Bengal.	44
			„ V. The storm-wave - - - -	55
			„ VI. The causes of the Backergunge cyclone.	66
19th April -	Government of India	Secretary of State -	Mortality from drowning and from cholera in Chittagong division.	70
27th March -	Government of Bengal	Government of India	Ditto ditto - - - -	70

Date.	From.	To.	Subject.	Page.
1877.				
27th March	- Resolution of Government of Bengal.	- - - - -	Mortality from drowning and from cholera in Chittagong division.	70
24th May	- Government of India	Secretary of State -	Cholera epidemic in Backergunge, Noakholly, and Chittagong districts.	71
5th May	- Government of Bengal	Government of India	Ditto ditto - - -	72
24th March	- Officiating Commissioner of Dacca Division.	Government of Bengal	Ditto ditto - - -	72
16th March	- Officiating Magistrate of Backergunge.	Commissioner of Dacca Division.	Ditto ditto - - -	73
14th March	- Civil Surgeon of Backergunge.	Magistrate of Backergunge.	Cholera epidemic in Backergunge	76
2nd April	- Government of Bengal	Dacca Commissioner -	Ditto ditto - - -	80
27th April	- Chittagong Commissioner.	Government of Bengal	Cholera outbreak in Chittagong division.	81
4th May	- Government of Bengal	Chittagong Commissioner.	Ditto ditto - - -	85
2nd August	- Secretary of State -	Government of India	Review of general subject of cyclone and storm-wave, and ensuing cholera.	86

P A P E R S

ON

The subject of the Bengal Cyclone and Storm-wave of the 31st October—1st November 1876, and the subsequent Cholera Epidemic.

DESPATCH from the GOVERNMENT OF INDIA to the SECRETARY OF STATE FOR INDIA.
No. 75. Home Department (Public).

MY LORD MARQUIS, Fort William, the 24th November 1876.

WE have the honour to transmit a copy of a telegram sent to your Lordship on the 17th instant regarding the effects of the storm wave which recently passed over the Chittagong, Backergunge, and Noacolly Districts in the Lower Provinces of Bengal.

We have, &c.

(Signed) H. W. NORMAN.
A. HOBHOUSE.
E. C. BAYLEY.
A. J. ARBUTHNOT.

Telegram No. 1,799, dated the 17th November 1876.

From PRESIDENT IN COUNCIL, Calcutta, to SECRETARY OF STATE FOR INDIA, London.

SIR RICHARD TEMPLE returned from the cyclone-stricken districts yesterday. He reports that the storm-wave in the Chittagong, Backergunge, and Noacolly Districts on thirty-first October, according to careful estimates, destroyed about 215,000 persons, with numerous cattle. All that is possible is being done for the survivors, and happily there is much less suffering among these from sickness, want of food or fresh water than could have been anticipated.

No. 1. of 1876.

DESPATCH from the GOVERNMENT OF INDIA to the SECRETARY OF STATE FOR INDIA,
Department of Revenue, Agriculture, and Commerce, Meteorology.

MY LORD MARQUIS, Calcutta, the 24th November 1876.

YOU have been already informed by a demi-official letter from our President of the terrible calamity which has occurred in the districts of Backergunge and Noacolly, which, on the night of the 23rd October last, were visited by a cyclone and storm-wave, resulting in a loss of human life estimated at not less than 215,000 souls.

2. We now submit for your Lordship's information copies of a letter from the Government of Bengal enclosing the Lieutenant-Governor's report, and of our reply. The facts are so fully and clearly stated in Sir Richard Temple's minute that we do not deem it necessary to make any observations on them, in addition to those which are contained in our Secretary's letter of this date to the Government of Bengal, further than to repeat the expression of the high sense which we entertain of Sir Richard Temple's promptitude in repairing in person to the scene of the disaster so immediately after it occurred, and thus furnishing himself with the best means of forming an estimate of its extent, and of the measures requisite for the relief of the distressed survivors.

3. On the 21st instant we communicated to the Government of Bengal the expression of the deep concern which Her Majesty the Queen was graciously pleased to signify on being informed of this lamentable occurrence. A copy of a letter from that Government, in which the Lieutenant-Governor gratefully acknowledges on behalf of the people of the province the sympathy expressed by Her Majesty, is enclosed.

4. We shall forward for your Lordship's information any further reports that may reach us on the subject.

We have, &c.

(Signed) H. W. NORMAN.
A. HOBHOUSE.
E. C. BAYLEY.
A. J. ARBUTHNOT.

From the JUNIOR SECRETARY TO THE GOVERNMENT OF BENGAL to the SECRETARY TO THE GOVERNMENT OF INDIA, Department of Revenue, Agriculture, and Commerce.

SIR,

Calcutta, dated the 22nd November 1876.

IN reply to your letter No. 517C, dated 15th November 1876, calling for a full and early report on the late cyclone, I am directed to submit, for the information of the Government of India, a copy of a minute recorded by the Lieutenant-Governor on the cyclone and storm-wave in the districts of Backergunge and Noacully.

2. Sir Richard Temple's account furnishes the latest information available up to the 12th of this month. Reports on the progress of events are still being received from the local officers, and as soon as these have all been received, they will be collated and a final report submitted. A special report by the Meteorological Reporter to the Government of Bengal is also under preparation, and will be submitted to the Government of India as soon as it is ready.

I have, &c.

(Signed) H. J. S. COTTON,

Junior Secretary to the Government of Bengal.

CYCLONE AND STORM-WAVE IN BACKERGUNGE AND NOACOLLY, 31st OCTOBER 1876.

MINUTE by the LIEUTENANT-GOVERNOR OF BENGAL, dated 21st November 1876.

HAVING recently returned from the cyclone-stricken districts, I proceed to record a brief narrative of my expedition, and a sketch of the case as it appeared to me and my party on the spot a week after the occurrence.

I was proceeding to Noacolly on an ordinary tour, having received reports only of a cyclone having occurred at Chittagong and Noacolly. Approaching Noacolly I heard of the disaster which had happened in the highly cultivated and thickly inhabited islands at the mouth of the Megna, known as the groups of Sundeeep, Hattea, and Dukhin Shahbazzpore, and on both the coasts of that great river; so I cut short my visit to Noacolly, after inspecting some of the ruined villages in that quarter, and hastened to the points where it seemed probable that the worst stress of the storm must have been.

Thus, besides the coast near Noacolly and the interior as far as that station, I visited the islands of Hattea and Dukhin Shahbazzpore in the Megna, near its mouth, and the western coast of the great river within the district of Backergunge. In each of these localities I visited a number of villages, and had the precise mortality in each house ascertained in my own presence on the spot, so as to prevent any possibility of deception. From the authentic data thus obtained I am able to check the local estimates, and to measure the mischief as it actually was. With me there was Mr. Reynolds (Secretary to Government) and Mr. Beverley, whose statistical ability is so well known; also Dr. Weir (temporarily on my staff), and some of the local officers.

Enclosed is an estimate of the probable number of lives lost (all, or nearly all, by drowning), prepared by Mr. Beverley and myself from our own data, compared with local reports, oral and written, and based on the returns of the last census. It will be seen that we apprehend that in an area of some 3,000 square miles, out of 1,062,000 persons, suddenly thrown into more or less of danger, 215,000 must have perished. This, of course is only an estimate; the exact number cannot be known yet a while, perhaps never will be known. We found in some villages 30 per cent. of the inhabitants lost, in others 50 per cent., in some even 70 per cent. The total seems very high; I earnestly hope that it may be found to exceed the truth, and that the facts may not prove to be quite so dreadful. Still such is the estimate at present. At the least there must have been a most shocking loss of human life. And even the urgency of our duty towards the surviving cannot drive from our minds the sorrow for so great a multitude of dead.

There was a severe cyclone in the Bay of Bengal on the night of the 31st October. But it was not the wind which proved so destructive, though that was bad enough; it was the storm-wave, sweeping along to a height from 10 to 20 feet, according to different localities; in some places, where it met with any resistance, it mounted even higher than that. I will endeavour to have meteorological inquiry made as to how and from what direction this inundation came. The Noacolly people think it came from the sea right up the great river (Megna) with salt water; that then the cyclone turned round and rolled the fresh water from the river downwards; that with this reflux there was a piling up, as it were, of fresh and salt water, venting itself by a rush all over the surrounding tracts.

I am not sure that this is the true explanation. It is understood that the eastern coast of the Megna and the Sundee Island, adjacent thereto, caught the inundation from the south-west. But the almost unvarying direction of the rent deflected and up-rooted trees in the islands of Hattea and Dukhin Shahbazpore, and the western coast of the Megna, convinced us that there the storm broke from the north and north-east.

In the evening the weather was a little windy and hazy and had been somewhat hot; but the people, a million or thereabouts of souls, retired to rest, apprehending nothing. But before eleven o'clock the wind suddenly freshened, and about midnight there arose a cry of "the water is on us," and a great wave burst over the country several feet high; it was followed by another wave, and again by a third, all three rushing rapidly southwards, the air and wind being chilly cold. The people were thus caught up before they had time even to climb on to their roofs, and were lifted to the surface of the water, together with the beams and thatches of their cottages. But the homesteads are surrounded by trees—palms, bamboos, and a large thorny species called Madârs. The people were then borne by the water on to the tops and branches of these trees. Those who were thus stopped were saved, those who were not must have been swept away and were lost. Doubtless there must have been variation in detail in this struggle for life with death. But there is an extraordinary sameness in the general manner in which people were saved or lost. In most cases they would show us the particular tree on which they stuck, and generally the survivors pointed to the severe scratches they received from the prickly branches of the Madâr trees; in reality these thorns and prickles held them tight, as if with natural grappling-hooks, and prevented them from being borne away.

The mode of habitation is in this wise. Each hamlet consists of four to six houses (to each house a family); these are built (thatch and matting) on a slightly raised platform, composed of earth thrown up from the surrounding ditch; they are surrounded by a wall of trees, high and dense. It was this formation, unvarying in kind, though varying in degree, that prevented the loss of life from being universal. Indeed, the trees, in their long stretching arms, held up the poor drowning souls. In those hamlets where the trees grew thickly many lives were saved; in those hamlets where there happened to be gaps or breaks in the environment of trees most of the inhabitants were carried off.

The bodies of the lost were carried to considerable distances, where they could not be identified. Most homesteads have dead strangers lying about, washed in from distant villages. The corpses began to putrify before the water cleared off the grounds, so they are left unburied in numbers all over the country (in a Mahomedan population there is no cremation). They are indeed masses of corruption which no one can bear to approach, and they present a sickening spectacle. Mixed with human bodies are the bodies of cattle, all heaped up together. The smell in many places was distressing, to us as we walked through the fields from village to village. Weather-tossed seamen in the Bay of Bengal saw many corpses floated out from land with the waves. Corpses from the Sundee Island were flung on to the seashore at Chittagong; and living persons were borne thither across an arm of the sea, clinging to the roofs or beams of the own houses, as if upon rafts.

As an authenticated instance (as described to me by the witness) of the suddenness of the onset of the storm-wave, I may mention that Mr. Higgins, an inspecting postmaster, was in his travelling barge that night, moored in the creek near Noacolly, about 10 miles inland from the Megna; he had gone to bed that night at eleven o'clock, without any fear or anxiety whatever; the boatmen were ashore, but his four native servants were on board with him; shortly before midnight he was awakened by a cry of "the waters are up:" jumping up he looked out and saw a high wave, with its crest and curling top gleaming in the starlight, it seemed like a flash; in an instant his boat seemed rising up on high; he fastened on a life-belt; in a few moments another wave came rolling on, and the barge capsized; he paddled about in the water all the rest of that night with the help of the life-belt; the native servants clung to spars—three were saved, one was lost; the water felt warm to the body, but the air was bitterly cold to the head or hands above the surface; of some natives lodged on the branches of a tree, one was seen to relax his hold from cold and numbness and sink into the flood.

If this happened at Noacolly, what must have been the emergency in the islands still more exposed to the fury of the storm?

The force of the inundation appears to have lasted in most places from about midnight to 2 a.m., that is, for two hours; by daybreak there was much subsidence of flood, and by noon next day the survivors had come down from the trees, and regained *terra firma*. But they must have been foodless and shelterless for the rest of that day and all the next day. After that, however, they began to re-assemble, not indeed at the ruins

of their homesteads, which had been carried away entirely, but at the sites and foundations. They took out their stores of grain buried in pits, dried those which were wet—the sun having come out in the cleared sky—and cooked such as were undamaged. At every homestead which I visited I found the people engaged in drying their grain. They also made frameworks with broken branches, over which they threw sheets and cloths, such as they had about them at the moment, and so made little tent-like habitations. Plantain trees abounded, but the fruit was mostly destroyed. The cocoanuts, however, very frequently stood through the storm, and must have afforded some sustenance. There must have been much trouble about water at first. But either the drinking tanks speedily recovered from the brackishness left by the salt wave, or else the storm-wave must have mainly consisted of fresh water; for the drinking tanks were not brackish when we tasted them a few days afterwards. It was a great relief to find that such was the case. Some tanks, and some swamps, indeed, are full of human corpses and dead cattle, and all manner of fetid matters, and cannot be approached; the streamlets which carry off the accumulated water were flowing black and thick with putrid substances.

No estimate can be made of the number of cattle drowned. They are chiefly bullocks and cows, some few are buffaloes, but the buffaloes are mostly saved, being excellent swimmers. The loss of cows is bad for the people, and the loss of oxen is still worse for agriculture. Fortunately there is no immediate demand for ploughing in the fields, so the loss will not make itself severely felt for some months.

In some places, and for the first two or three days, the people seem to have been often in want of food; they could not get at their stores. In some places they suffered severe hunger, assailing with entreaties for food the Rev. Mr. George Kerry, who was one of the first to appear among them. But this difficulty must have gradually subsided, for when I saw them there was no clamour for food particularly, though there was naturally loud lamentation for their sorrows generally; nor were there any signs of hunger; on the contrary, the noticeable circumstance was the trouble the people were taking to dry their grain. The demeanour of those who really bore the brunt of the storm was marked by that enduring fortitude under suffering which distinguishes the native character.

Nor was there at the time of my visit any sign of epidemic sickness anywhere, save around Noacolly. How long this immunity will be vouchsafed to the poor survivors may be a question anxiously asked. We have since learned that cholera has broken out on the Chittagong coast and on the east side of the Megna.

For the first day or two after the catastrophe there were some attempts at plundering, and some lawlessness broke out; but all this was promptly suppressed. Gang robbery used to prevail formerly in these tracts, and the robber spirit still survives among the instincts of the people; the fear was that, unless authority could be quickly vindicated, many persons would be tempted to take advantage of the sudden disruption of all social bonds to superadd crime to the many evils already inflicted on the land by a physical visitation. I trust, however, that the difficulty will be found to have been encountered and subdued.

Most of the local native officials were drowned, deputy magistrates, police inspectors, native civil judges, notaries, and others. Of those who escaped, some stood by their posts and did their duty well. Some few deserted and fled for their own safety, forgetting their charges; these, however, belonged chiefly to the lowest grade of the police, and will be duly punished. Among the police, some behaved so well as to merit reward. There were few resident landlords and few land agents on the spot. The villagers mostly consisted of cultivators with various kinds and degrees of tenures, and of sub-proprietors—a substantial yeomanry in fact—and they were the richest peasantry in all Bengal.

When the storm burst there was an abundant rice crop ripening for the harvest—the well-known deltaic rice crop, which is much beyond the needs of local consumption, and affords quantities (measured by thousands of tons annually) for exportation to distant districts. A part is lost, that in which the plant had not advanced beyond the stage of flowering, and a part is safe still, that in which the grain had formed or begun to form. If even one third is saved that would suffice for the population now on the land.

The boats, great and small, which constitute the only carriage in these tracts, and which fill the place of carts, were all lost on the night of the storm, jammed and smashed up together, or wrecked or disabled, or carried inland and left high and dry. The Noacolly authorities were thus bereft of all resources for moving across the floods. In the case of the Hattea Island this was very hard; by reason of the loss of all boats there were no means of crossing the Megna to reach the island, and for three days at least it was

succourless. The people on the mainland knew its danger, but could not cross over to it. The Backergunge authorities were more fortunate; their boats escaped destruction, and they were able to move with all the promptitude that could be desired. The Chittagong authorities had most of their boats temporarily disabled, but, despite their own pressing needs, they managed to send succour to the devastated islands of Sundeeep.

Most of the trees, fruit bearers or others, will recover; except the Areca or betelnut palms. These exist in great numbers, of which very many are broken, snapped off as it were, and much of the betel crop just being gathered was destroyed, though some part was saved. The country here is well wooded, but at present it has lost all verdure and sylvan appearance; it seems to be stricken by a withering winter, and wears a drab colour, with bare branches or dead leaves, or trunks contorted, as if torn by some super-human destructive agency. Many trees, torn up by the roots, were carried away with the flood into the great river, and there remained as sunken trees, known to sailors as "snags," so dangerous to navigation. They virtually barricaded the passage out to sea by the western branch of the Megna, so that we were barred from approaching by water the seaface of the devastated tracts. The "snags," extending over an expanse of water, looked as if they had been set up by an enemy.

The wealth lost was almost entirely agricultural—crops or cattle. To this, however, there is one notable exception, namely, Dowlutkhan, a rich trading town, clean destroyed, with loss of miscellaneous property and valuable records. It had 8,000 inhabitants, one fourth of whom perished, perhaps more. Approaching the place, we steamed for two miles through a creek, the banks of which all the way were strewn with human bodies, floated up and down by the tide.

I give this outline of the case judging by what I saw of it, and from what I heard from those who were in it. The local authorities did instantly all they possibly could, and some of them managed to do a great deal. The immediate obstacle was of course the difficulty of communication. Still, day after day, sometimes hour after hour, officials, non-officials, messengers, guards, supply boats, arrived at some point or other of the wide and scattered scenes of disaster. Since the first few hours of inevitable destruction, not a life, so far as I could learn, had been lost from any preventable cause, nor had anyone been in extreme danger. Those who perished in that fatal instant of time passed suddenly beyond aid; but those who escaped then are still sustained, or are sustaining themselves sufficiently well. The disaster, big though it be, has yet happened in the midst of plenty, and of rural wealth. All around the fated and wasted area there are excellent crops and abundant stores. Those who have lost their agricultural wealth have still some left, and doubtless possess considerable credit. Soon, therefore, will boats come pouring in by the numerous channels from districts teeming with water-carriage; soon will fresh cattle be swum or ferried across the rivers from the overstocked districts of Eastern Bengal; soon will the grain bazars be reopened, and the rustic marts be filled with the surplus produce of neighbouring tracts.

The local authorities have indeed opened "relief centres," dotted all over the distressed tracts, and they afford relief in some cases; but this is done very sparingly; and though any case or cases of real danger or sickness will be watched for, so that no life can be lost (as we hope), save from incurable sickness, still we trust that very little relief will be really needed. The relief centres are as much for guard as for relief; are established for the purpose of restoring order, of preventing confusion, of keeping rustic society together, of making every responsible person stick to his work, and of ensuring that public confidence, without which trade of all sorts cannot quickly be restored. All this is being done with the utmost energy that the local officers can command, and all the staff, both European and Native, that can reasonably be required has been or is being despatched to the spot. Our object is to let the poor people see that the authorities are thinking, caring, feeling for them in their misery. This knowledge will brace their nerves, raise their spirits, and induce them to return promptly to all their accustomed industries.

There will be some extra police for a month or two, but that will not be much; also some relief expenses. There probably will be hereafter some advances to cultivators for purchasing plough-cattle (to replace the cattle drowned), but these advances will be recoverable, and will be made only on security. Altogether the expenses will probably not be beyond the means of local or provincial funds, and I hope to be spared the necessity of asking the Government of India for any financial aid.

We are prepared, so far as medical aid goes, for the contingency of epidemic sickness. Two parties of native doctors have been already despatched, and more will be kept in readiness.

I hope also that there will be no appreciable loss of revenue. The land revenue forms a small part of the profits of the land in these heretofore flourishing tracts, and is paid by very well-to-do persons. We got in all our land revenue during the infinitely worse case of the famine of 1874 in every district of Bengal and Behar, and I fully intend to enforce the same rule now, if possible. Nor is there any considerable loss to be feared under the other heads of revenue.

But, although I hope for the best regarding the surviving population, I still remember that things might take a turn for the worse, and that there may be distress of which information has not yet reached us. In that case the numerous temporary stations which have been established, and the many responsible persons who are moving about, have instructions to act with all necessary effectiveness. Sickness and pestilence are the things uppermost in our fears.

The following is the *resumé* of the instructions which I gave on the spot to the local authorities :—

- 1st. Throughout the devastated tracts to establish posts of observation at points sufficiently numerous to ensure the condition of the people in every village being thoroughly watched, so that if there are any cases, or even a single case, of dangerous distress they or it may be surely discovered.
- 2nd. To afford relief in any cases where it is necessary to save life ; but in all cases short of this extremity to be very cautious in affording direct assistance of this sort.
- 3rd. To stop those attempts at plundering or lawlessness which are to be apprehended after a physical catastrophe such as that which has occurred.
- 4th. To preserve social order ; to urge the people to rebuild their cottages quickly ; to induce shopkeepers to re-open their shops ; to re-establish local bazars and markets ; to assure all persons, especially those who bring supplies or livestock from without by river, that their boats and property are safe against any sort of attack or interference.
- 5th. To encourage and induce all landed proprietors of any grade, superior or inferior, and their agents, to stay in or return to their respective properties, to help their tenants and dependants.
- 6th. To see that the regular police set a good example, and that the village watchmen stand by their posts.
- 7th. To ascertain whether any cash advances will probably be necessary to enable cultivators to purchase cattle for agriculture.
- 8th. To investigate numerically the casualties which actually occurred on the fatal night of the 31st October.
- 9th. To be prepared to establish medical stations and dispensaries in event of epidemic sickness breaking out.
- 10th. To incur such expenditure as may be absolutely necessary under the above instructions, but with this reservation, to be very economical in spending money.
- 11th. To arrange for the taking of a new census, on some date during December next, of the people remaining in the local divisions (thanas) which have suffered from the storm-wave.
- 12th. To discourage or refuse any applications for remission of land revenue.
- 13th. To act promptly in any emergency which may arise, not provided for in these instructions.

The Commissioner of Dacca, Mr. F. B. Peacock, proceeded immediately by steamer with assistance to Backergunge, and supervised the local arrangements. The Acting Commissioner of Chittagong, Mr. A. Smith, despatched with excellent promptitude assistance to the Sundeep Islands, under Mr. Badcock, which we trust arrived in time to prevent disaster. He and a non-official landholder, Mr. Macalpin, joined my party at Hattea Island. The Magistrate of Backergunge, Mr. E. Barton, was as prompt as possible in sending every sort of help to the scene of distress ; his conduct in that trying moment has received my high commendation. The District Superintendent of Police, Mr. H. N. Harris, proceeded at once to Dowlutkhan, the spot of all others where his presence was most needed, and was personally very active and resourceful. The Reverend Mr. G. Kerry (of the Baptist Mission) volunteered to visit some of the tracts where hunger was most feared, and distributed supplies from Government among those who were most in need ; he was among the first to appear on the scene of destruction. Mr. R. Porch, the Magistrate of Noacolly, speedily organised relief establishments along the coast line of his district. Mr. R. Harvey, manager of the Paikpara estate, proceeded to the islands to assist the distressed tenantry. The Nawab Abdool Ghunnee, of Dacca, sent his steamer and some large boats, which will be very useful for

the conveyance of men and of supplies. Most of the zemindars were non-resident; but on hearing of the disaster they hurried off agents, or went in person, to their estates. I am sure that they will be found doing their duty as landlords.

It may be asked, in conclusion, whether any protective means against such calamities in future can be devised—any embankments or the like? This question will be duly considered; but at present I know not how to devise such safeguard, nor have I seen anyone who can suggest anything. The area to be protected would be too great to be encompassed with protective works. If embankments became breached in such a storm, they would afterwards do more harm than good, for they would prevent or retard the running off and the subsidence of the waters. Perhaps the people might build perches for themselves on platforms, on stilts, and the like; but the trees which invariably surround the homesteads serve this purpose admirably, and it is to them that the survivors mainly owe their escape.

There is always this consideration, too, that these disasters, though not unfrequent somewhere or other in a less severe form, do not visit the same locality in such intensity, save at long intervals of time. Without specifying the exact date when the last event of such gravity befell the delta of the Megna—one case of this kind happened in 1822—most people say that there has been nothing like the recent cataclysm since the middle of the last century.

(Signed) RICHARD TEMPLE.

ESTIMATE of the NUMBER of PERSONS DROWNED in the CYCLONE of 31st October 1876.
In the Backergunge District.

	Population.	Probable number drowned.
Dukhin Shahbazzpore Island	221,000	70,000
Bowful thannah	118,000	15,000
Golachipa ditto	98,000	20,000
	<u>437,000</u>	<u>105,000</u>

In the Noacolly District.

Sundeeep Island	87,000	40,000
Hattia ditto	54,000	30,000
Sudharam thannah	96,000	5,000
Bounnee ditto	33,000	5,000
Ameergaon ditto	133,000	10,000
	<u>403,000</u>	<u>90,000</u>

In the Chittagong District.

Meerkaserai thannah	120,000	10,000
Koomeria ditto	26,000	5,000
Chittagong ditto	76,000	5,000
	<u>222,000</u>	<u>20,000</u>
Total	<u>1,062,000</u>	<u>215,000</u>

AREA.

In the Backergunge District.

Dukhin Shahbazzpore Island	818 square miles.
Bowful thannah	194 ditto.
Golachipa ditto	804 ditto.

Total - 1,816 square miles.

In the Noacolly District.

Sundeep Island	-	-	-	} Exact area cannot be given; may be roughly stated at about 900 square miles.
Hattia ditto	-	-	-	
Sudharam thannah	-	-	-	
Boumnee ditto	-	-	-	
Ameergaon ditto	-	-	-	

In the Chittagong District.

Meerkaserai thannah	-	-	-	} Exact area cannot be stated; may be roughly stated at about 380 square miles.
Koomeria ditto	-	-	-	
Chittagong ditto	-	-	-	

From the OFFICIATING SECRETARY TO THE GOVERNMENT OF INDIA to the SECRETARY TO THE GOVERNMENT OF BENGAL.

SIR,

Calcutta, the 24th November 1876.

I AM directed to acknowledge the receipt of Mr. Cotton's letter of the 22nd instant, No. 3,705, forwarding copy of a minute recorded by the Lieutenant-Governor on the cyclone and storm-wave which have recently devastated portions of the districts of Backergunge and Noacolly. The President in Council has read with painful interest the account of this terrible calamity which is contained in Sir Richard Temple's minute, a calamity which, as regards the number of human lives lost, to say nothing of the destruction of cattle and other animals, is scarcely paralleled in the annals of history. The Lieutenant-Governor estimates that in an area of some 3,000 square miles, out of a population of about a million, some 215,000 persons have perished. The loss of property, and especially of cattle, a very serious matter in an agricultural district, has been of course considerable. The local authorities appear to have done everything that was in their power to afford relief to the survivors in the devastated tract. The Lieutenant-Governor makes special mention of the Commissioner of Dacca, Mr. F. B. Peacock; of the Acting Commissioner of Chittagong, Mr. A. Smith; of the Magistrate of Backergunge, Mr. E. Barton; of the Magistrate of Noacolly, Mr. E. Porch; and of the District Superintendent of Police, Mr. H. N. Harris. The exertions of the Reverend G. Kerry, of the Baptist Mission, and of Mr. R. Harvey, manager of the Paikpara Estate, are also specially mentioned, as well as those of Nawab Abdool Ghunnee, of Dacca, who sent his steamer and some large boats to the scene of the disaster. The President in Council requests that the thanks of the Government of India may be conveyed to all these gentlemen for their services.

2. To his Honour the Lieutenant-Governor, who, with his characteristic energy, visited the locality within a week after the occurrence of the cyclone, the Government of India and the public are much indebted for his clear and interesting narrative of the results of his inspection, and for his judicious directions to the local authorities. Sir Richard Temple's presence on the spot so immediately after the catastrophe must have been invaluable as an encouragement to the officials, and as an assurance of the sympathy of the Government with the survivors of the population in the sufferings to which they have been exposed. The Government of India will be glad to receive any further reports and more detailed information that may reach the Government of Bengal.

3. The Government of Bengal have been already informed that Her Majesty the Queen, immediately on hearing what had occurred, was graciously pleased to signify by telegraph her deep concern at the terrible calamity which has thus overwhelmed a large body of Her Majesty's subjects. A similar expression of concern and sympathy has been received from his Excellency the Viceroy.

4. A copy of Mr. Cotton's letter and its enclosure, and of this reply, will be published in the "Gazette of India" for the information of the public.

I have, &c.

(Signed) T. C. HOPE,

Officiating Secretary to the Government of India.

No. 2. of 1876.

DESPATCH from the GOVERNMENT OF INDIA to the SECRETARY OF STATE FOR INDIA,
Department of Revenue, Agriculture, and Commerce, Meteorology.

MY LORD MARQUIS,

Calcutta, the 1st December 1876.

IN continuation of our Despatch No. 1, dated the 24th ultimo, we have the honour to forward for your Lordship's information copy of a further letter from the Government of Bengal, with enclosure containing a report from the Officiating Commissioner of the Dacca Division, in which some details are given of the results of his inspection of those parts of the district of Backergunge where the storm and inundation of the 31st October were most severely felt.

We have, &c.

(Signed) H. W. NORMAN.
A. HOBHOUSE.
E. C. BAYLEY.
A. J. ARBUTHNOT.

No. 3,748, dated the 27th November 1876.

From H. J. REYNOLDS, Esq., Officiating Secretary to the Government of Bengal, to the
SECRETARY TO THE GOVERNMENT OF INDIA.

In continuation of Mr. Cotton's letter, No. 3,705, dated the 22nd instant, I am directed to submit the accompanying copy of a report from the Officiating Commissioner of the Dacca Division, giving some details of the results of his inspection of those parts of the district of Backergunge in which the storm and inundation of the 31st October were most severely felt.

2. It appears to the Lieutenant-Governor that while this report bears out very painfully the estimate already submitted regarding the dreadful loss of human life, it also sustains the hope which the Lieutenant-Governor had formed as to the speedy recovery of the district from the effects of the visitation.

No. 134T, dated on board the Steamer "Teesta," the 19th November 1876.

From F. B. PEACOCK, Esq., Officiating Commissioner of the Dacca Division, to the
SECRETARY TO THE GOVERNMENT OF BENGAL, Financial Department.

IN continuation of my letter No. 409, dated 6th instant, and subsequent correspondence, on the subject of the cyclone which passed over the district of Backergunge on the night of the 31st ultimo, I have the honour to submit the following account of a tour of inspection I have this day returned from round those portions of the district where the effects of the storm were most severely felt.

2. On Sunday the 12th instant his Honour the Lieutenant-Governor, who had arrived the previous day, left Burrisal. Mr. Barton, the Magistrate of the district, and myself accompanying him as far as the sub-division of Perozepore, which we reached early next day.

3. As I have already reported in my letter No. 411, dated 7th instant, this sub-division escaped the storm-wave, though some damage was done by the cyclone. A good many houses were blown down, and the Deputy Magistrate informed me that about one eighth of the crops had been injured. From what I could see, however, I think this is rather a high estimate.

4. Leaving Perozepore at 11 a.m. on Monday the 13th, Mr. Barton and I proceeded straight to the sub-division of Patuakhally, which we reached the next morning. The place is a perfect ruin, not a single hut having been left standing. The residence of the sub-divisional officer, his office, the Moonsiff's cutcherry, the school, the lock-up, the police outpost, the sudder distillery, and the dispensary, have all shared the general fate. Notwithstanding the complete destruction of the place, only one life was lost, an old woman's, who was killed by the falling of a house. The crops have been but little injured; the bazar was being supplied as usual; there was no distress, and no unusual amount of sickness of any kind. I may add that the whole of the damage was caused by the wind, the storm-wave not having penetrated so far inland.

5. I gave orders for estimates to be prepared for the re-erection of the public offices, and the Executive Engineer has been directed to send an overseer to the place for this purpose. As it is of great importance that the ordinary work of the sub-division should be resumed with as little delay as possible, I have the honour to request that, in anticipation of formal sanction to the estimate, which will be submitted as soon as prepared, the Collector may be authorised to advance to the Executive Engineer the sum of Rs. 2,000, in order that the necessary buildings may be commenced upon at once.

6. From Patuakhally we proceeded to Golachipa thana, the jurisdiction of which extends over about 800 square miles in the south-eastern portion of the district, and which from its exposed position we knew had suffered as severely as any place, not even excepting the island of Dukhin Shabazpore. On our arrival we found that the reports that had reached us had not been exaggerated. Three storm-waves of from 15 to 20 feet high have swept over the place, literally levelling it with the ground. Not a single hut and hardly a post was left standing, while large mandar trees and whole clumps of bamboos torn up bodily by the roots sufficiently testified to the overpowering force of the wind. It is as yet too soon to attempt to compute, with anything like accuracy, the loss of life which has occurred. This will be done later on, when the census ordered by the Lieutenant-Governor is taken. Some idea of it may, however, be formed from the figures given below.

7. From inquiries made, man by man, among a miscellaneous crowd of persons from Golachipa and the neighbouring villages, we ascertained that, out of the total number of which their families had been composed, 41·55 per cent. had perished. From other inquiries made from house to house by Mr. Barton, myself, and Baboo Troilakya Nath Sen, the Deputy Collector in charge of relief operations, we found in one place that out of 156 persons, 55, or 35·25 per cent., had been drowned, while in another 68 persons out of 115, or 59·65 per cent., had been swept away. The loss among the cattle has also been very great; I should think not less than 80 per cent.

8. Amidst all this misery it is satisfactory to notice that the crops have suffered far less than would be supposed. I do not think that hereabouts the amount of damage done will exceed four, or at the most six, annas, and this, it must be remembered, out of an exceptionally good crop. In places the "Gribi," a kind of *aous* dhan, had already begun to be cut, and in a few days the harvesting of the *aghani* or earlier *amun* will have commenced. For the first few days, no doubt, gratuitous relief was absolutely necessary. Every golah had of course been blown down, and the greater portion of their contents scattered to the winds. What little grain was saved had to be collected and dried, and for some few days the people were for the most part so appalled by the catastrophe that had fallen upon them that but little was done. Now, however, that they are resuming their usual occupations, and the new crop coming in, gratuitous relief is no longer required; it has therefore been ordered to be discontinued, and the surplus stocks of grain and salt sold at cost price. The health of the people is generally good, and no cholera has as yet appeared amongst them. There is no want of drinking water, several tanks about being quite free from any impurity.

9. From Golachipa we proceeded still further south to the Rabunbad Islands, amongst which we visited Korulia, Burra Bansdia, and Kujul Churs. Here the havoc committed by the storm was very much the same as that at Golachipa, except that, if possible, it was greater, the very bhitas of the houses having been broken down. The storm-waves, judging from the drift that clung about the few trees that were standing, must have been from 20 to 30 feet high. The loss of life has been consequently greater here than at Golachipa. The result of inquiries made by ourselves from house to house in the three churs above mentioned was as follows:—In Korulia, out of 296, inhabiting 34 houses, 225 or about 75 per cent.; in Burra Bansdia, out of 146, living in 19 houses, 98 or 67·12 per cent. were dead; while in Kujul, out of 21 persons, composing five families, we only found four alive. Very much the same result was obtained by the relief officer on Chur Rangabolia, another of the same group of islands, where the percentage of deaths was 76. Very few cows or bullocks have escaped. In Chur Bansdia, in one house, I counted nine, the property of three or four different persons; but I do not think I counted half a dozen more during the whole of my walk about the island, extending over upwards of two hours. Mr. Barton's experience on Chur Korulia was exactly the same. Buffaloes, being strong swimmers, had fared better, but even among them the loss has been very considerable.

10. Here, too, we found that the crops had been more extensively injured. In Bansdia the out-turn will, I think, be about six or seven annas; in Korulia eight annas; and in Kujul ten annas. There was a good deal of jungle about the last, and this to some

extent protected the crops, and accounts for their being better than those on the neighbouring islands. The people all had rice in their houses, but it was all more or less damaged, though quite eatable, and the stocks were not large. Still the people exhibited no signs of distress, and as gratuitous relief is no longer necessary it will be discontinued.

11. The next place visited was Dowla, on the western side of the island of Badura, to the west of Dukhin Shabazpore. This had apparently suffered somewhat less than the Rabunbad Islands; the mortality, according to inquiries at 20 houses, being 44·36 per cent.; the crops, too, were better, and we estimated the out-turn at from 10 to 12 annas.

12. Proceeding along this island in a northerly direction we landed at a place called Diola, where we met a relief officer, who informed us that he had been informed there was some distress in the centre of the island, which, judging from the appearance of the people we saw, I think very unlikely. There is no reason also why distress in the centre should be greater than distress at the sides of the island. However, he was ordered to proceed at once into the interior and inquire into the truth of what he had heard, reporting within two days the result to Mr. Harris, the District Superintendent of Police, who has the general control over all relief operations in Dukhin Shabazpore and the adjacent islands.

13. Rounding the northern extremity of Badura we then proceeded south down the Gayar River, landed at Chur Shumbhoopoor, on the west part of Dukhin Shabazpore. The crops here are worse than we have found them anywhere, and I do not think the out-turn will be more than six annas. There was no appearance of distress, though the people complained of want of salt,—a want, however, that I do not think could have been very pressing, as they were within easy reach of a relief centre at Tozumuddin, on the other side of the island, where the following day I myself saw salt exposed for sale in the haut.

14. From Shumbhoopoor we proceeded across the Megna to the island of Manpura, which we reached at 10.30 of the morning of the 16th instant. Here we found Deputy Magistrate Moulvie Mafuzooddeen and Moulvie Mahomed Hafez in charge of relief operations. Manpura is another of the places which experienced the full force of the storm, and where consequently the mortality has been great, though not so great as in the Rabunbad Islands. Our inquirer showed that in 102 families, consisting of 1,013 persons, 532, or slightly over 52 per cent., had been drowned. Considering what they were exposed to the crops here are wonderfully good. The early *amun*, sown over about 2-16ths of the cultivated area, and now being cut, will not yield less than a twelve-anna crop, while the “Chuplas” and “Banspati” rice, sown over 6-16ths of 8-16ths of the cultivated area, will yield probably a ten-anna and a nine-anna crop respectively. The people are busy rebuilding their houses, and trade is reviving. One of the principal shopkeepers in the place had received an advance of money from the Deputy Magistrate, and had left for the mainland to purchase rice, salt, dāl, &c., &c. There is plenty of drinking-water; the people are no longer in any distress; and, with the exception of a little rheumatism and fever, there is no sickness. All relief has been ordered to be stopped, and the Deputy Magistrate directed to return to head-quarters, after disposing of his surplus stock of rice, salt, &c.

15. Leaving Manpura we recrossed the Megna, and landed first at the village of Kosnaddee, and then at Tozumuddin, both on the east coast of Dukhin Shabazpore. The former is in a very exposed position, and our inquiries showed that out of 114 persons, comprising ten families, 46 or 40·35 per cent., have been swept away. The *aghani* crop is fair, and will yield about ten annas, the later rice appears to have been more injured, and will probably not be more than a five or six anna crop. At Tozumuddin we found the Reverend George Kerry, who had volunteered to take charge of the relief centre established here. This place, standing more inland than Kosnaddee, has suffered less, both as regards mortality and in the damage done to the crops. Mr. Kerry's figures give a death-rate of something over 15 per cent. among upwards of 7,000 persons—a rate that was confirmed by inquiries made by ourselves among a miscellaneous crowd assembled at the haut, which was being held for the second time since the storm. I found it fairly stocked with rice, nearly all more or less damaged, dāl, fish, salt, oil, treacle, spices, betels, and some cloth. The crop will be about a twelve-anna one all round, and there is no longer any distress requiring gratuitous relief. Mr. Kerry has therefore closed his operations, and after disposing of his surplus stock of food, for which he expected to find a ready market, will return to Burrisal.

16. The next place visited was Dowlutkhan, the head-quarters of the Dukhin Shabazpore sub-division, where we met the District Superintendent Mr. Harris. While coming up the khal from the river, a distance of between two and three miles, I counted

no less than 76 corpses, though this was the seventeenth day after the storm. The Lieutenant-Governor has himself recently visited Dowlutkhan, and it is therefore not necessary for me minutely to describe its condition; suffice it to say that it is a complete wreck. The sub-divisional buildings, the Moonsiff's cutcherry, the school, the thana the lock-up, and the sudder distillery have, together with the whole bazar, been levelled with the ground. The population being a floating one, it is impossible to attempt to estimate the loss of life that has occurred, though this must necessarily have been very large.

17. The following is, I believe, a complete list of the Government officers and servants who have lost their lives:—Moonsiff, rural sub-registrar, native doctor, post-master, court sub-inipector, abkaree darogah, two abkaree burkundauzes, seven constables, a mohurir of the Moonsiff's court, and a post-office peon. Mr. P. M. Gasper, a zemindar, and eight members of the family of the Deputy Magistrate, have been drowned, besides many hundreds in the bazar itself. Up to the 17th, nearly 250 corpses, in a fearful state of decomposition, have been drawn out of tanks, or extricated from the débris of houses in the bazar itself and its immediate neighbourhood, and floated out into the river. Many more must have been swept away altogether, and there are undoubtedly many still undiscovered among the ruins of the place. The atmosphere is in many places simply poisonous; and it is wonderful that some epidemic has not broken out among the people. Most of the tanks are full of decaying matter, animal and vegetable, and it is hard to conceive anything more sickening than the smell arising from them. I feel sure that if the people were to continue where they are disease must break out amongst them. I have therefore ordered the bazar to be moved to the north side of the khall, where the sub-divisional buildings stood. This being to windward of the bazar, the atmosphere is comparatively uncontaminated, and there is ample space and an abundant supply of wholesome drinking water. I have directed one large tank in the centre of this piece of ground to be reserved exclusively for drinking, and have prohibited all bathing or washing of clothes or utensils in it. For these purposes other smaller tanks are available close by. I trust the Government will approve of the action I have taken in this matter. It really involves no hardship, for none of the houses in the bazar have been rebuilt, and the people may just as well erect temporary sheds and huts on one side of the khall as on the other. I have also ordered the people to be informed that the sight of the sub-division will be changed, so that those who will move with it may not incur unnecessary expense in providing accommodation for themselves and their goods now.

18. In the meantime, arrangements have been made for resuming the ordinary work of the sub-division until a new site has been decided upon and the necessary buildings erected. The Collector will send out at once an excise darogah and staff, and a temporary distillery will be worked. Very few records and books have been saved, and what have been are much damaged. These will require to be examined and arranged; those that can be made any use of being retained and the rest destroyed. All the stamps and stamp paper have been destroyed or blown away, except one bundle of non-judicial four-anna stamps, and this has been so completely saturated with water that I doubt if they can be made any use of. The sub-divisional treasure chest has been recovered, but a wooden chest, said to contain about Rs. 1,500, is missing. This has probably been broken open and looted in the confusion that prevailed during the first two or three days succeeding the storm. Indeed, in this respect the people as a body seem to have behaved shamefully. Everything that appeared likely to contain property of any value that they could lay their hands on was broken open and rifled of its contents; and there is I fear reason to suppose that this indiscriminate plunder was not merely the work of the bad characters of the place.

19. The crops about Dowlutkhan are much the same as those we saw about Kosnaddee and Tozumuddin; the *aghani* rice will be a ten to twelve anna crop; the *aous* from six to eight annas. The haut has been re-established, and I found in it a fair quantity of rice at 20 seers the rupee, salt at three annas a seer, dâl, fish, treacle, tobacco, betels, and some vegetables and fowls. All distress has ceased, and Mr. Harris has been directed to stop all further gratuitous relief; to sell off his remaining stock of rice, salt and dâl; to call in all the subordinate relief officers; settle his accounts, and return to head-quarters.

20. From Dowlutkhan we proceeded up the east coast of the island, landing at Goneshpura, in the north-east corner of it, to inspect the crops, which are much the same as at Dowlutkhan. From thence we went to Bhola and Ruttonpore, places situated respectively about four and six miles inland on the north-western part of the island. Here there had been hardly any storm-wave, and no loss of human life, though a few cattle had been drowned. I think one or other of these places should be selected as the future head-quarters of the sub-division. They are neither of them as centrally

situated as I should like, but there appears to be no other place more in the interior that would answer as well. Of the two, I prefer Bhola, a place of considerable trade in rice and betel nuts. It has good water communication, which is essential, and it is connected with Dowlutkhan on the other side of the island by a road. I inspected a piece of land which I think will answer well as the site of the sub-division. It is high land, and has two or three tanks of good water already upon it, which will probably save the expense of digging others. I have directed the Executive Engineer to make a survey and prepare a block plan of the place, and this, when ready, will be submitted with a further report for the orders of Government.

21. Our next point was Bowfal, where we found Mr. Gupta, the sub-divisional officer of Patuakhally, and Baboo Jadu Nath Chowdhury, the Deputy Magistrate in charge of relief operations in this thana. This place was also visited by the Lieutenant-Governor in the course of his recent tour. Hardly a single kutchha house has been left standing, and though the storm-wave was not nearly so high here as in the Golachipa thana, Dukhin Shabazpore, and Manpura, the loss of life has been very great. About one fourth of the entire area of the thana, 194 square miles, was subjected to the fury of the storm, and the deaths in this portion of it, roughly estimated to contain between 27,000 and 28,000 people, are computed to be about 7,000. A census taken by Mr. Gupta himself in six villages shows that 27·6 per cent. of the inhabitants perished, and 87·8 per cent. of the cattle.

22. The crops will yield an average of ten annas, and all distress has ceased. Relief operations have been closed, and the surplus stock of rice despatched for sale to Backergunge, where it is expected a better market will be found for it than at Bowfal itself. No sickness has yet made its appearance; but the town is in a terrible condition, and this, and the fact that there are a number of small tanks and pools all about it contaminated with every kind of abomination, lead me to fear that it may still break out. I therefore directed Mr. Gupta to watch carefully the health of the people, and to apply to the Magistrate for medical aid the moment there was any necessity for doing so.

23. The last place visited was Kujlakatty, in the Backergunge thana, where there has been considerable loss of life and destruction of cattle, though nothing so serious as in many other places. At first, too, there was a good deal of distress, but this has entirely ceased; and the Deputy Magistrate, Moulvie Tuzummul Ally, who had had charge of relief operations, had closed them before our arrival and returned to Burrisal.

24. From what has been said in the foregoing paragraphs of this Report, it will be seen that there is no longer any reason to suppose that the people in the tracts affected by the cyclone are in want of food, nor, as the early *amun* crop is now either being cut, or will be in the course of the next few days, does there appear to be any necessity to adopt special measures to watch their condition. At first, no doubt, there was very considerable distress, but this was relieved by the timely arrangements made by the Magistrate of the district. The supplies of food which he sent to the places that had suffered most gave the people time to recover from the effects of the calamity that had overtaken them, to erect something in the way of shelter for themselves and families, and to dry the small quantities of rice they had managed to save. In the meantime also haunts were re-established and trade revived, and with this ceased the necessity for further relief, which was then discontinued.

25. There are two most providential circumstances about the late storm—first, that the crops were not utterly destroyed; and, secondly, that the storm-wave, or rather succession of waves (for there were three), was composed of fresh and not of salt water. It seems almost incredible that the crops should neither have been levelled by the wind nor torn up by the roots by the rush of water over them. At first I was inclined to think that, as for some time before the waves came the water had risen steadily, they might have been merged before the former passed over them, and had thus not felt the violence of an immense volume of water being suddenly thrown upon them. But this theory, it is clear, can only apply to places over which the storm-wave or waves passed, while the crops are standing just as well in places which only experienced the force of the wind. In some places, no doubt, they were protected to some extent by surrounding belts of trees and jungle; but in many others I saw wide plains, of miles in extent, which had no screen of this kind. Whatever may have been the cause, it is certain that the crops have not been laid, and in this fact lies mainly the removal of anxiety as to the condition of the people. With regard to the second point, the water being fresh, no injury has been done to the land, except possibly from a small deposit of sand upon it, and even this we saw nowhere. Instead, too, of all the tanks being made brackish and undrinkable by an infusion of salt water into them, we found no place where there

was any want of drinking water, notwithstanding that so much of it had been contaminated in other ways. The calamity is bad enough as it is, but had the above circumstances not attended it, or had it occurred a month or two earlier in the year, it would have been infinitely worse.

26. I have endeavoured in the figures I have given above to enable some idea to be formed of the loss of life that has occurred; these figures being, with one or two exceptions, the results of inquiries made by Mr. Barton and myself at the various places we visited. Any estimate based upon them can, however, be nothing more than approximate; but a census of those thanas which suffered most will be taken at the commencement of the ensuing year, from which a very nearly exact computation should be possible.

27. Next to the fearful loss of human life, the most serious part of the calamity is the enormous destruction of cattle, which in many places will not, I fear, fall short of 80 or 90 per cent. It is clear that if a considerable portion of these cannot be replaced much land will next year remain uncultivated, and it is not yet known whether the people have the means of replacing them. The Backergunge ryots in general, and those of Dukhin Shabazpore in particular, are as a rule remarkably well-to-do, and as any money they had is sure to have been buried, this will not have shared the fate of their other property. I hope therefore that, with a little help from their zemindars, and possibly in some cases from Government, they will be able to purchase bullocks enough to plough their land.

28. I have already been directed to convey to Messrs. Barton and Harris the Lieutenant-Governor's acknowledgments of the excellent service done by them in the late crisis, and I now desire to bring to his Honour's notice Mr. Bertelson, the Assistant Superintendent of Police, Deputy Magistrates Baboo Anund Chandra Sen and Moulvie Tuzummul Ally, who have throughout the relief operations worked with an energy and judgment deserving of all credit. The Reverend G. Kerry came forward as a volunteer when the Magistrate was greatly in want of relief officers, and has since that time laboured indefatigably and at great personal inconvenience in relieving distress, in ascertaining the condition of the people and the state of the crops, and in making inquiries as regards loss of life and destruction of cattle. I trust that I may be permitted to convey to these gentlemen his Honour's approbation.

29. In conclusion, I have to add that, as Mr. Barton and most of the district staff have returned to the station, I have directed Mr. Currie to rejoin his appointment as Joint Magistrate of Dacca, where his services are now more urgently required than at Burrisal. I request that, if necessary, he may be re-gazetted to the former district. I would further beg that the two Sub-Deputy Collectors, who are no doubt, in conformity with the Lieutenant-Governor's instructions, now under orders for Backergunge, may not be countermanded. As things settle down into their places, there will be heavy criminal work at both the Dukhin Shabazpore and the Patuakhally sub-divisions, and various local inquiries will have to be made, though any special watching of the people will not be required. For some time at least, therefore, I anticipate that a single officer will not be able to go through the work at either place, and at the same time visit from time to time the interior of a sub-division—a duty this year of more than ordinary importance. I would propose, therefore, that one of the additional officers directed to be sent should be posted to each of these sub-divisions, where there will be ample work for them for the next two or three months to come. At the end of that period they can either be removed, or their services can be utilized in connexion with the work under the Land Registration Act, which in Backergunge will be particularly heavy.

No. 4. of 1876.

DESPATCH from the GOVERNMENT OF INDIA to the SECRETARY OF STATE, Department of Revenue, Agriculture, and Commerce, Meteorology.

MY LORD MARQUIS, Calcutta, the 8th December 1876.

In continuation of our Despatch No. 2, dated the 1st instant, we have the honour to forward for your Lordship's information copy of a further letter* from the Government of Bengal, and enclosure, containing a report by the Commissioner of the Chittagong Division, in which

* Dated the 4th December 1876.

he gives further particulars of the effects of the late cyclone and storm-wave in the district of Chittagong and the neighbouring island.

We have, &c.

(Signed) H. W. NORMAN.
A. HOBHOUSE.
E. C. BAYLEY.
A. J. ARBUTHNOT.

From the JUNIOR SECRETARY TO THE GOVERNMENT OF BENGAL to the SECRETARY TO THE GOVERNMENT OF INDIA, Department of Revenue, Agriculture, and Commerce.

SIR,

Calcutta, dated the 4th December 1876.

IN continuation of the correspondence ending with this office letter No. 3,748, dated the 27th November, I am directed to submit the accompanying copy of a letter* from the Commissioner of the Chittagong Division, giving further particulars of the effects of the late cyclone and storm-wave in the district of Chittagong and the neighbouring island.

* No. 380G, dated 23rd November 1876.

2. It will be observed that in the tract referred to, which is on the east side of the Bay of Bengal, the damage done by salt water was much greater than in the localities visited by the Lieutenant-Governor and his party, which lay much further to the west. The cyclone on the Chittagong coast came from the south-west and passed in a north-east direction; whereas in Dukhin Shahbazzpore, and along the mainland of the Backergunge coast, the course of the storm-wave was from the north-east, and the wave was in a great measure composed of fresh water.

I have, &c.

(Signed) H. J. S. COTTON,
Junior Secretary to the Government of Bengal.

No. 380G., dated Chittagong, the 23rd November 1876.

From A. SMITH, Esq., Officiating Commissioner of the Chittagong Division, to the SECRETARY TO THE GOVERNMENT OF BENGAL, in the General Department.

IN continuation of my letter, No. Jct., of the 12th instant, I have the honour to submit a further report on the effects of the late cyclone in the district of Chittagong and the neighbouring island.

2. The later reports received from the Collector and his subordinates sent out on relief work give a much more favourable account of things than was at first expected. It has now been satisfactorily ascertained that in the southern half of the district—that is, south of the River Kurnafoolee—there is no distress requiring any immediate help. The Magistrate reports that rice is selling along the sea coast, which in that part of the country had the worst of the cyclone, having been visited, though lightly, by the storm-wave, at 13 seers a rupee, and that the neighbouring hâts are being well attended. Those living nearest the sea have indeed lost their crops, and a few unfortunates have had their property washed inland with no great chance of finding it again. There has also been a heavy loss in cattle, but I do not think that advance for the purchase of cattle will be very necessary there. As was anticipated by me, the water in the tanks is becoming sweeter, and it is hoped that in a few days more the people will have no want of drinkable water.

3. At Kootubdia the crops are reported to have been very badly injured, and all round scarcely a six-anna crop is estimated by the sub-divisional officer of Cox's Bazar, who personally visited the island. The sea is said to have risen 12 feet above its ordinary level, and the whole island was under three feet of water. The Government khas tehsil, cutcherries, and native houses have generally been blown down, and the house of the superintendent of the lighthouse, with a portion of its protective revetments, has been carried away, only a masonry wall of the former surviving the wreck. The lighthouse itself is reported to have rocked, but has stood well. To remove the very generally felt want of sweet water the Sub-Deputy Collector stationed there has been directed to sink wells. No loss of life is reported from this island, but houses in the northern part of it are said to have been washed away, while no vestige is left of any

embankment, artificial or natural. The loss to Government on account of embankments alone is estimated at about Rs. 6,000. The western shore of the island is strewn with the dead bodies of human beings and cattle, nearly 300 of each. The sub-divisional officer has taken steps for the early burial of these carcasses. There was, however, no sign of any very great distress, but some rice has been supplied to the Sub-Deputy Collector to relieve any case of real destitution.

4. In the northern half of the district, with the exception of Kumaria and Sitakoond, there is nothing very exceptional beyond the usual damage more or less to crops, and the general destruction of houses everywhere. Later reports from Kumaria and Sitakoond, though still gloomy, are much more hopeful, and show that the crisis, as far as the immediate effects of the cyclone is concerned, has been tided over.

5. The state of the western half of these two thanas is thus described by Mr. Assistant Collector Pargitar, who is still on deputation there for purposes of relief.

"The storm-wave swept right across the country in an easterly or north-easterly direction, reaching everywhere, except at Kumaria, as far as the Government road, and wherever the road was low it passed across over the land to the east. The quarters from which the cyclone blew with the greatest violence were west and south. The wave passed over the road between Kumaria and Sitakoond at two places, one being Kuman Ali's hât, where the damage was greater. Generally, the damage seems to have been the greatest from this hât to some miles north of Sitakoond, and the marks of destruction are most abundant for two miles to the north, as described in paragraph 2. What damage has been caused yet further to the north in the Noakholly Division I do not certainly know, but I have heard that several miles of telegraph lines have been broken and injured."

"The wave swept everything before it, passing over the face of the country in a body of water about 12 feet deep at about three-fourths of a mile from the high road. Everything was swept onwards by it in its course, and the broken remains of boats were carried two or three miles inland. People were washed over from Sundeeep, and supported themselves on roofs of houses, planks, bamboos, &c. Many children are said to have perished in the way. The people on the mainland here who could do so mounted the largest trees they could find, and remained there until the water receded. There is not a single house left standing; and the contents of the houses were carried off and scattered far and wide. I have seen about 50 corpses myself, besides hundreds of dead cattle of every kind, and the dead bodies of many birds. The reported number of deaths at first was very high, the people saying that at least one half of the inhabitants had been drowned; but they must have included the number of those who fled eastward and thronged the road. Now that all these persons have returned to their houses, the number of those who really perished in the storm can be ascertained with tolerable accuracy, especially since the matabars have had to distribute the rice to the survivors. I have inquired of many mohullas the number of persons who perished in the cyclone; the total number for about 50 mohullas, subject to this outpost and containing 4,000 houses, is about 1,900 persons; hence it would appear that (allowing $5\frac{1}{2}$ persons to each house) the mortality among human beings has been 8.5 per cent. It is not to be supposed that all these bodies have been found or are to be found. Large numbers have been found and buried, others still lie here and there unseen among the fields, but without doubt very many must have been carried out to sea on the reflux of the wave. The mortality among the cattle has been immense, and I think that at least one half have been destroyed. They lie about the country in large numbers, but more must have been swept out to sea. I have given orders for the removal of the former, and shall make journeys through the villages to see whether my orders have been complied with. The people who have been washed over from Sundeeep, and some even from islands beyond, have been relieved by grants of rice and money, and have been, as I hear, forwarded from Kumaria to their houses."

"Sitakoond was filled with pilgrims at the time of the cyclone, and, owing to the destruction of the houses, and the overcrowding greatly increased thereby, cholera broke out. As soon as the storm was over they began to evacuate the place, mostly in a northerly direction, whence the greater number had come, and the virulence with which the disease would otherwise have raged has been checked thereby. There have, however, been five or six deaths each day; and it is the opinion of Dr. Murray that it will continue to prevail until the country is cleansed of the taint with which it is everywhere pervaded. Before my arrival the police carried out the dead and laid them close by the roadside, but I have removed them and given orders to have future dead bodies carried away into the midst of the fields. The presence of the native doctor and the

establishment of the temporary hospital will materially improve the health of the town and the surrounding country.

"The wave, as I have before said, swept the whole of the country to the west of the Government road, and all the crops there will be destroyed. As one proceeds in a westerly direction the fields are found to be inundated with salt water, which at a distance of a mile from the sea shore is generally a foot deep, in some places much more; and the depth increases with the proximity to the sea. The crops this year were superior to those of several past years, and the cultivators were anticipating a gain therefrom which would recoup them for former bad harvests. Those near the sea were more advanced than those inland, and would have been fit for reaping in a few days. The grain is still in the ear, and when reaped will furnish the people with a little sustenance. I have pointed this out to them. They are just recovering from the stupor produced by the general destruction, and are now taking every means to save all they can. They all say that in a week or two the growing crops will have withered and died from the salt water, but till then will furnish food for the cattle which remain. The only hope which remained after the storm of the crops being saved was that a plentiful rain would fall, but there has been none hitherto, and the probability as regards the future is small. The crops inland are young, and the cultivators say they are likely to perish. The land on which they stand is moist with salt water; they may continue to grow, but, if so, the produce will be small and poor. I have seen some of the crops which are standing in salt water putting forth new growths, but this would appear to be merely a transient effect. The general result will be, I think, that all the crops to the west will die, and the only harvest which will be detained will be the grain near the coast, which was approaching maturity. It is quite impossible to state what proportion this would be of the whole.

"Wherever the wave has passed over the road to the east side the same results, though in a mitigated form, will follow as on the west, but the wind has there blown out of the ear all the ripening grain, and has extracted the juices of the young and growing crops. The cultivators say these are ruined, and that they will obtain no harvest this year. It is possible that the latter may recover and produce some grain still; it will be but poor. It is difficult to give a precise statement; I suppose about one third of these crops are not yet in flower."

"The people are exerting themselves everywhere now to recover and preserve their property of all kinds. They have begun to remove the débris from their houses and build fresh houses, though they find much difficulty in procuring the materials. All bamboos, posts, thatching, &c. which the storm has brought near them they have freely appropriated. Those who live near the coast have lost almost everything, while those further inland have gained much that the former have lost, for the wave bore everything inwards with it. Owing to this fact there have been many disputes, and the finder usually refuses to restore to the real owner waifs and strays. Boxes containing much valuable property have thus been seized and rifled of their contents, and the claimants can frequently obtain no redress, as the thieves cannot be found out. Such disputes have led not infrequently to quarrels and assaults. In order to afford the dispossessed speedy redress I have exhorted the matabars to convene an assemblage of their principal villagers and decide such claims. But as, from what I have heard, this course seems open to much abuse, I purpose to proceed through the villages and settle such matters, for it would appear that the finders sometimes entertain doubts as to the rights of the claimants, and give up the goods on being satisfied.

"I visited several houses yesterday, and made a thorough search into all I could find there. Each person has sought for his property and brought it back when found; and on discovering the *handis* containing his grain, has searched the ground near. Whatever grain he has thus found (often almost grain by grain) he has carefully washed, sifted, and dried in the sun, and then stored away again. The labour bestowed on preserving the grain is sometimes surprising. Some grain has begun to germinate, but it is dried and then kept. Other grain of last year, which has been much damaged, is first dried in the sun, then boiled, dried again, and put away. So, too, with regard to chillies, kuddus, suparis, and other articles of food. Clothing of kinds has been dried carefully in the sun, and cotton has been picked, separated, dried, and put away. In every *bari* which I visited I found a maund or two of rice, Pous or Shail, or of all together, and sometimes as much as five or six maunds. There was besides a jar of chillies or suparis, and sometimes a small file of kuddus, or a small pot of dried fish. All these articles, however, have been soaked in the salt water, and are more or less injured."

6. Mr. Veasey and the newly arrived District Superintendent, Mr. Platts, are directed to put down the misappropriation alluded to with a vigorous hand, and they are now ended. Timely aid, in the shape of rice and cash, has been freely given here in cases of proved necessity, and there is at present no apprehension of any immediate distress. I have called upon Mr. Veasey to submit accounts, which, when received, will be duly submitted for the approval of his Honour the Lieutenant-Governor.

7. Tanks in these parts also have been rendered brackish by the influx of salt water, and many of them, being polluted by dead bodies, bamboos, grass, and débris generally, have become pestilential pools. Fortunately there are many springs and hill streams on the eastern side of the trunk road, but as they are not within easy distance of every place, Mr. Pargitar fears that the people will have recourse to the impure water at their doors, instead of resorting to the purer supply at a distance, adding one to the many unavoidable causes of sickness. Cholera is unfortunately raging very virulently over this part of the district, and in fact exists generally wherever the salt water had access. Steps have been taken to clear the neighbourhood of dead bodies by means of municipal sweepers. I have also directed Mr. Pargitar to see if some of the tanks—selections being made according to the necessity of the place—cannot be refilled by diverting the water of the nearest hill streams. One native doctor is already on the spot, and I intend sending him an assistant as soon as the three men expected by to-morrow's steamer arrive.

8. The prospect of the cold weather crops in this part of the district is thus described by Mr. Pargitar:—

“According to the general accounts of the inhabitants there is no prospect of any cold weather crops being obtained. The ground, they say, has been so impregnated with salt from the salt water that it will remain sterile until fertilized by the rains of next year. They expect then to obtain a moderate harvest, but the earth will not regain its former fertile condition for two years. They have no seed fit for sowing, and they say that if they were to sow all their fields they would reap but a paltry harvest, receiving less probably than they had sown. This disastrous condition is rendered more so by the loss of their cattle; many of the cultivators are absolutely destitute of the means of ploughing and tilling their land, and those who have lost beasts will still be straitened in cultivation of their fields. Their implements of agriculture have also been lost or destroyed, and the broken remains of ploughs are to be seen along the roads.”

9. I have not received much information from the Collector of Noakholly about Sundeep, but from a report submitted by the Deputy Collector, Mr. Sarson, who was sent with relief from the Chittagong side, I find there is no want of food. Mr. Sarson thus describes the state of Sundeep:—“In the afternoon went ashore and viewed the state of the country. The whole place looks as if had been on fire, and the whole vegetation, including the large trees (such as mango, jack, cocoanut, &c.), seem burnt up. There is a regular look of desolation in every direction you turn your eye. This southern part of the island is said to have suffered more than the northern. The water is said to have risen 12 to 15 cubics by native account, but I took the trouble to measure these trees in their different places on which rubbish had been deposited when the tide receded, and found it to be 11, 13, and 15 feet, according to the rise and fall of the land; the average may therefore be taken at the least at 12 feet. Such a body of water rushing over the land must have been most disastrous and terrific, and the effect has been, as may be imagined, the loss of hundreds of human lives, and of cattle, and the destruction of every house in the place. The houses have not been simply blown down, as in Chittagong, but have been literally carried away, no one can say where, and large boxes have also been washed away. With regard to the growing crop of paddy on the land, I should say that the people will get about four annas in this part of the island. There will, however, be cases in which some persons who planted late will lose their all, but on the whole the crop will be a four-anna one, and it is now ready for cutting. Grain, however, in the ear is not so fully developed as it would have been had it been allowed to mature another fortnight, but the people need not starve.”

After the measures that have already been taken it may now safely be asserted that there is no apprehension of any death from starvation.

10. The destruction of cattle along the seaboard of both the districts of this division, and at Sundeep, Hatya, and its adjacent island, has been of a wholesale character. The Collectors are inquiring to what extent it may be necessary to give effect to his Honour's suggestion to advance money to ryots on security for replacing their stock. In Noakholly the afflicted tracts belong largely to the estates of the Courjon and Paikpara

minors, both of which are now fortunately under the management of the Court of Wards, and provisions for the purchase of cattle could, if necessary, be easily made by the Collector. In the district of Chittagong the zemindars are, on the contrary, mostly petty landholders; but Merkaserai largely belongs to the local zemindar Baboo Goloke Chunder Roy, who I trust will not be wanting in the public spirit he has elsewhere shown on an occasion like the present.

11. As regards the damage done to the port, the Conservator has submitted a further report, from which it appears that all the principal buildings and the buoys have escaped without any injury worth mentioning, only the boats and kutchas having been somewhat injured. The port jetty, as already reported, is a complete wreck, and orders have been issued to put up the screw-pile one, the stores of which are lying in Calcutta.

12. As to the shipping, the two vessels that were reported as missing have since turned up, and it has been definitely ascertained that only one native vessel was lost in the storm. The European vessels, with the exception of two, seem to have escaped any very material injury, and will shortly be re-floated. The Commissioner's steamer and flat, and the Magistrate's schooner, have been got into water, but one of the pilot cutters and a Government budgerow are still aground. Mr. Warden estimates the damage done to the rice stored for shipment at 56,000 maunds, equivalent to about Rs. 84,000. About 50,000 maunds of rice were afloat on the night of the cyclone, of which only about 8,000 maunds will have to be re-landed for executing necessary repairs to the vessels containing them. Besides this, of 50,000 lb. of tea stated to have been stored for shipment, about 17,000 have been damaged, and about another 22,000 have suffered more or less from inundation.

Mr. Warden's remarks regarding the gloomy prospect of the trade are quoted *in extenso* for the information of the Lieutenant-Governor:—

“However serious the damage done by the cyclone to the shipping in the port (and of course necessarily it is very considerable), the injury is as nothing in comparison to the loss to the trade and the gloomy forecast over the business prospects for the year, both of which were most promising, and seemed pregnant with abundance and prosperity to all engaged. All the preliminaries had been settled for establishing a direct trade in jute between Naraingunge and Europe *via* Chittagong, and which doubtless would soon have been followed by the addition of many, if not all, the other products of Eastern Bengal which are now exported to Europe by the longer and very much more expensive route of Calcutta. The rice was beginning to come in copiously, and whatever differences there had been between the vendors and buyers of rice had been laid aside, either permanently or forgotten for the time being, and confidence was felt in a lively resumption of the trade of the port of Chittagong, which had been languishing for the past three years owing to the pressure of exceptional circumstances, which, differing in themselves in each of the years of decline under allusion, are no criterion of a permanent decline of the trade.

No. 5, of 1876.

DESPATCH from the GOVERNMENT OF INDIA to the SECRETARY OF STATE FOR INDIA,
Department of Revenue, Agriculture, and Commerce, Meteorology.

MY LORD MARQUIS,

Calcutta, the 15th December 1876.

In continuation of our Despatch No. 4, dated the 8th instant, we have the honour to forward for your Lordship's information copy of another letter* from the Government of Bengal, and its enclosure, containing a further report by the Commissioner of Chittagong on the effects of the late cyclone and storm-wave in the Noakholly District.

* No. 3,895, dated the 7th December 1876.

We have, &c.

(Signed) H. W. NORMAN.
A. HOBHOUSE.
E. C. BAYLEY.
A. J. ARBUTHNOT.

From the JUNIOR SECRETARY TO THE GOVERNMENT OF BENGAL to the SECRETARY TO THE GOVERNMENT OF INDIA, Department of Revenue, Agriculture, and Commerce.

SIR,

Calcutta, dated the 7th December 1876.

IN continuation of this office letter No. 3,833, dated the 4th instant, I am directed to submit, for the information of the Government of India, the accompanying
 * No. 398 G, dated 23rd November 1876. copy of a letter* from the Commissioner of Chittagong, submitting a further report on the effects of the late cyclone and storm-wave in the Noakholly district.

I have &c.

(Signed) H. J. S. COTTON,
 Junior Secretary to the Government of Bengal.

No. 398 G, dated Chittagong, the 23rd November 1876.

From A. SMITH, Esq., Officiating Commissioner, Chittagong Division, to the SECRETARY TO THE GOVERNMENT OF BENGAL, General Department.

IN continuation of my letter No. 380 G, of the 23rd instant, on the subject of the ravages committed by the late cyclone in this division, I have the honour to submit a further report, embodying such information as has since been received from the Magistrate of Noakholly.

2. In this district, besides completely washing the islands of the Sundeeep and Hattea groups, the cyclone wave swept the whole of the seaboard, the nearest main roadway generally marking the limit of its ravages. In some places, as in north Merkasarai and the mid Fenny tract, it penetrated further inland, though with abated force. Men, cattle, and houses have in large numbers been washed away, the survivors saving their lives either by climbing trees or floating on the roofs of their houses. The destruction of cattle and other domesticated animals seems to have been almost wholesale, and the loss of life and property has generally been greater than on the Chittagong seacoast. The islands were inundated at night during the mid-fury of the cyclone, but the wave proceeded so slowly that while the villages on either side of the mouth of the River Kurnafoolee were flooded at about 2 or 3 a.m., the inundation occurred on the coast of Noakholly about 4.30 in the morning, which soon supervened. Daylight must have enabled large numbers to save their lives who would otherwise have perished; the calamity would not have been half so disastrous if the inundation had taken place in the day. In my No. 359 G, of the 12th, I said that the loss of life could not be much, if at all, below 40,000, and might be more. The inquiries that have since been made, and a comparison of the results with the figures of the late census, indicate a much more serious total. The general census, to be held next month, will give more reliable figures, but the following is a rough present approximation :—

Seacoast, from Kurnafoolee to Fenny, about	-	6,000
One third residents of Sundeeep	-	29,000
Half residents of Hattea	-	27,000
Coast of Noakholly	-	20,000
		<hr/>
		82,000

3. As to the crops on the islands, the estimates made and the opinion expressed by different people are very conflicting. Those I personally saw on the eastern side of Sundeeep are very much like what the Lieutenant-Governor saw in Hattea, that is, they were ripe and pretty well filled with and likely to yield a good outturn. Mr. Sarson's estimate has already been communicated. Mr. Badcock says the crops on the western side are damaged. On the other hand, the Moonsif-Magistrate tells me that the crops round the edges are ripe and good, but that those on the higher lands in the centre, being unripe, have been pretty nearly destroyed. The export traders in Chittagong, who have their own source of information, estimate the crop left at from six to twelve annas. The islands usually export largely, and it may be safely accepted that, considering the great loss of population, there will be ample food for the survivors. The great difficulty under which I found the people labouring was that of cutting the crops; they were offering half the produce to people to come and assist in cutting them, and, owing to the fear of cholera, they could not induce acceptance of the offer.

4. In the distressed tracts Mr. Porch took early steps for establishing the following relief circles :—

Circles.	Head-quarters.	Circles.	Head-quarters.
1. Thana Sudharam	- Sudharam.	5. Hattea - - -	} Nilakhyi.
2. „ Bamni - -	- Old Bamni.	6. Nulchiri- - -	
3. „ Mersarai - -	- Faradnagar.	7. Sundeep - - -	} Sundeep.
4. Lakhypore - -	} Lakhypore.	Magdhara - - -	
Raypore - - -		7. Siddhi Lakhyi - -	} Siddhi.
Balammara - - -		Bodu - - -	
Chur Manasa - -			

5. Relief was regularly issued by the officers in charge of these circles, mostly deputy collectors and police officers of the higher grades, who had instruction to give gratuitously to those who had no means, and to sell at cost price to those who could pay. To the island of Sundeep Mr. Badcock, Joint Magistrate of Chittagong, was sent with relief, and acted in co-operation with the officers sent from Noakholly for the same purpose. Distribution centres were opened at—

1. Sundeep.	3. Hudeakhal.
2. Doparkhal.	4. Neamosti.
Magdhara.	

Through these circles and centres rice, gur, oil, fresh water, clothes, salt, and money have been distributed either gratuitously or at cost price, as the circumstances of the case rendered necessary, and by this means all immediate distress has, I believe, been everywhere relieved. No further direct assistance will, I hope, be for the present required. An account of the expenditure will be submitted as soon as it is received from the Collector, from whom it has already been called for.

6. Mr. Porch also took active measures for restoring communications between the several parts of his district, these having been very seriously interrupted by the destruction of bridges and cutting of roads, while boats were scarcely to be had, most of them having been either sunk or thrown high and dry on the land.

7. The police were strengthened, and the Magistrate ordered them to take immediate cognizance of all cases of criminal misappropriation; he reports that only a few cases have up to date come to his notice. A great deal of property has no doubt changed hands, and some people have enriched themselves at the expense of their neighbours; but the Magistrate thinks the accounts of such plundering as actually took place were greatly exaggerated. The Magistrate will, however, be told to see that such cases of misappropriation as come to light are so dealt with as to induce the return of their new treasures by others, and the Magistrates of both districts will be instructed to warn finders that they are bound to return and liable to punishment for criminal misappropriation if they don't. The stories that were widely circulated to the discredit of the police, of their having taken part in the plunder, the Magistrate reports, rest on small foundation. No genuine complaints have reached him, except as regards the outpost of Nulcaira, in Hattea, where two policemen, implicated in a case of appropriating silver ornaments, are in jail awaiting trial. To assist in repressing the crimes likely to crop up after such a wide-spread disaster, as well as to meet the strain that will be brought to bear upon his executive establishment generally, the Magistrate proposes to strengthen it by appointing Sub-Deputy Collector Baboo Bogola Prasono Mazumader, who has already been deputed to one of the worst affected parts and is doing good service there, temporarily as a Deputy Magistrate from the 10th instant, the date on which he was sent out to Hattea. He was, I find, on a previous occasion recommended for a similar appointment by Mr. Lewis, in his letter No. 44Ct., dated 29th November 1875. The recommendation has my approval. The nominee is an energetic young man, descended from a good family, and is the only educated non-official native of the place.

8. Thus everything has been done to re-establish order, and the people, who were at first stunned by the suddenness and completeness of the disaster, are now gradually returning to their avocation. Confidence is restored, the people are fast falling back into their old groove, and cholera is the chief difficulty that they have now to contend with. Medicines have been widely distributed through the police and from the local dispensary. The subordinates of the civil medical officers were sent out to visit houses and give medical relief in the immediate neighbourhood of the station, and three native doctors were deputed to the following relief centres where the disease was raging :—

1. Chururia, five miles south-west of this station.
2. Taktakhali, six miles south.
3. Jagadananda, five miles south-east.

4. Old Bamni.
5. Chaprassee Hât.
6. Faquiri
7. Zorwargunge outpost.

The civil medical officer and his staff are reported to have worked indefatigably in keeping up supplies of medicines.

9. The salt water difficulty on the islands is not so serious as might have been expected. On Sundeeep some of the tanks are sweet, and on Hattea, which lay on the western side of the Vortex which passed over Noakholly. The wind was northerly, and the inundation was consequently largely fresh water from the Megna, and not sea water. The heavy rain now falling, and which seems connected with another cyclone to the westward, will assist generally in making the tanks less brackish and eliminating the salt from the ground; its effect on the crops it is not so easy to estimate. Those that are ripe and uncut it will probably somewhat injure, by causing the grain to sprout; where they are unripe, the reduction of the brackishness of the soil and the washing off the salt from the plants themselves should be beneficial. Whether it will have on the prevalent cholera the effect that rain usually has in March and April may be doubted, for it will aggravate the noxious emanations from decaying thatch, bodies, and carcasses, and increase the discomfort to which houseless people are subjected, and these are no doubt in part the causes of the present sickness.

No. 1. of 1877.

DESPATCH from the GOVERNMENT OF INDIA to the SECRETARY OF STATE FOR INDIA,
Department of Revenue, Agriculture, and Commerce, Meteorology.

MY LORD MARQUIS, Calcutta, the 12th January 1877.

IN continuation of our Despatch No. 5, dated the 15th ultimo, we have the honour to forward for your Lordship's information copy of a letter* from the Government of Bengal and its enclosure, being a further Minute by his Honour the Lieutenant-Governor on the effects of the late cyclone and storm-wave in the Sundeeep group of islands in the district of Noakholly.

* Dated the 18th December 1876.

We have, &c.

(Signed) A. HOBHOUSE.
E. C. BAYLEY.
A. J. ARBUTHNOT.
A. CLARKE.
J. STRACHEY.

FROM the JUNIOR SECRETARY TO THE GOVERNMENT OF BENGAL to the SECRETARY TO THE
GOVERNMENT OF INDIA, Department of Revenue, Agriculture, and Commerce.

SIR, Calcutta, dated the 18th December 1876.

IN continuation of my letter No. 3,895, dated 7th December 1876, I am directed to submit herewith, for the information of his Excellency the Governor-General in Council, a copy of a further Minute, dated 15th December 1876, recorded by the Lieutenant-Governor, regarding the effects of the late cyclone and storm-wave in the Sundeeep group of islands in the district of Noakholly.

I have, &c.

(Signed) H. J. S. COTTON,
Junior Secretary to the Government of Bengal.

ADDITIONAL REMARKS ON THE EFFECT OF THE CYCLONE AND STORM-WAVE IN THE SUNDEEP GROUP OF ISLANDS ON 31ST OCTOBER 1876.

MINUTE by the LIEUTENANT-GOVERNOR OF BENGAL, dated the 15th December 1876.

The description of the storm-wave in Backergunge and Noacolly, and its effects, as given in my Minute of the 21st ultimo, referred more particularly to Noacolly proper, to Hattea, and to the Backergunge district, but not so much to the Sundeeep group of

islands (belonging to Noacolly) which I had not been able to inspect personally. On the 19th of November I deputed Mr. F. H. Pellew, of the Civil Service, to the Sundeeep group of islands, he being an officer specially experienced in relief operations elsewhere, and also having formerly served in Eastern Bengal. He has now returned from his deputation, and I wish to record briefly my impressions regarding the Sundeeep group of islands after conferring with him.

2. The Sundeeep lands differ in some respects from those of the other islands which I described in my Minute of the 21st ultimo. Being of older formation, the ground in Sundeeep proper is somewhat higher towards the centre. The habitations, instead of being scattered in little hamlets, are towards the centre collected into large villages well protected by trees, and (what was very important) having large tanks with high banks round them. Consequently, although towards the shores of the islands the people were swept off exactly in the manner I previously described, yet towards the middle they for the most part escaped, as the wave was not relatively quite so high, and the trees were more efficiently protective, apparently checking the rapidity of the wave, and allowing the poor people a few minutes of time, during which they crowded on to the banks of the tanks, and so kept their heads above water. On the outer villages towards the shores the mortality was quite as sad as anything that has been reported. In the inland villages it was fortunately less.

On the other hand, the storm-waves here came from the south, that is, from seawards, and receding left the tanks and other drinking water brackish (instead of being fresh, as was happily the case in Hattea and in Backergunge), and caused the stagnant water, remaining after the wave had passed, to be foetid. Thus cholera set in soon after the first disaster. Then, on the 23rd November, there came a storm of wind and rain (the ghost, as it is called, of the cyclone), suddenly lowering the temperature of the atmosphere and sorely chilling the houseless people. This fresh misfortune aggravated the choleraic plague. Thus Mr. Pellew found the people in a state of deep depression. It seemed as if the survivors of the cyclone-wave would slowly perish by pestilence. Every arrangement which forethought could suggest had been begun by the local authorities, and has been carried out further by Mr. Pellew. Native medical officers with medicines have been stationed at appropriate places. Additional assistant surgeons have been despatched from Calcutta. The Sanitary Commissioner, Dr. Coates, was deputed to Chittagong during November; he is already at work on these islands. The cholera is abating in the north part of the islands, but is still bad in the south, and there is no knowing when it will cease there. Wherever the cholera has abated, there the people are rebuilding their houses, and rehabilitating themselves altogether. They have supplies of food, also a fair crop on the ground; but the reaping and harvesting is delayed, because the cultivators are attending their sick and burying their dead. In one part of the island there is a Government estate; in another part an estate under the Court of Wards. There will be no difficulty in making advances to distressed cultivators. These will be needed, as the destruction of the cattle was almost total and absolute. The plundering and other attempts at mischief have been stopped.

4. The estimate now given of mortality in the Sundeeep group of islands differs somewhat from that given in my Minute of the 21st November. Out of a population of 87,000, I understood that 40,000 had perished in the catastrophe. Mr. Pellew makes out that not more than 25,000 perished at first, but that several thousands have since died from the effects of the catastrophe, and some thousands are still dying. He fears that, before this said affair is ended, the mortality will fully equal the higher estimate of 40,000.

5. I here cite a few remarkable facts extracted from Mr. Pellew's notes.

"The people in the villages on the south-western coast stated that the inundation commenced with a wave at least six feet high, which burst over the land from the south-east. Very shortly after another wave, six feet higher, came from the south-west. These waves came suddenly, just like the bore, mounting up and curling over. The second wave is described as lifting the roofs of the houses, and whirling the contents—human beings, with furniture, &c.—violently outside. The mat walls with their wooden posts were swept away, the latter being either broken off short or wrested out of the ground. All this was done suddenly; people described it to me as occurring in one second of time. Behind each wave the water did not fall again, but remained, so that after the second wave there was 12 feet of water over the land.

"In the centre of the island the water came up less suddenly. The Government Pleader at Hurrishpore was taking refuge from the storm in his new cutcherry. Suddenly an alarm was raised that the water was coming. He got on the wooden dais,

but the water immediately covered this. He then went, up to his neck in water, along a raised path, to the bank of his tank, which is about 12 feet high; he told me that the rising of the water did not take longer than two minutes from first to last, and that he was only just in time. The bank of the tank was not more than 10 yards from his cutcherry. I saw the place myself. This was in Hurrishpore, the most central village.

"In the village of Nyamustee one man was the sole survivor of 13; four men were the survivors of a household of 25. The women have perished in immense numbers. Most of the men who remain are wifeless.

"In Kangalee Chur (an island of Sundeeep) the Sub-Inspector found nothing but two wild buffaloes alive, and the corpses of men, cows, and buffaloes.

"In Chur Moolavee, out of 177 people 137 died.

"In some villages along the west coast of Sundeeep, out of a population of 2,460 people 734 were drowned."

6. As regards cholera, Mr. Pellew writes—

"The mortality generally in South Sundeeep threatens to exceed the mortality from the inundation. The returns for 33 beats (with a population of 10,855 souls) give the deaths by drowning as 1,063, whereas those from cholera in the same tract have already amounted to 764.

"In Gachooa 111 people have died in a population of 1,033. In Dublaphar 83 have died in a population of 236. In Amanulla 84 have died in a population of 692. The greatest mortality from cholera is in the central portions of the islands, where the mortality from the inundation was comparatively trifling."

7. Mr. Pellew expresses himself as unable to suggest any protective works as against storm-waves in future. The old embankments round parts of the island which did exist only made matters worse on this occasion.

8. The thanks of Government are due to Mr. Pellew (who very properly volunteered for the duty) for his exertions in this sadly important case. I am sure that his visit and inspection must have been of great service to the suffering people. He makes a very favourable report regarding the exertions (under trying circumstances) of Baboo Umakanth Doss, Deputy Magistrate, whose services will be duly remembered by me.

RICHARD TEMPLE.

No. 6. of 1877.

From the GOVERNMENT OF INDIA to the SECRETARY OF STATE FOR INDIA, Department of Revenue, Agriculture, and Commerce, Meteorology.

MY LORD MARQUIS,

Simla, the 12th April 1877.

WITH reference to your Lordship's telegram dated the 21st ultimo, we have the honour to forward three copies of the Report *

* By Book Post.

of the Meteorological Reporter to the Government of Bengal on the cyclones which visited the Vizagapatam and Backergunge Districts in October 1876.

2. The charts illustrating the gradual formation of the cyclone are still under preparation, and will be transmitted to your Lordship as soon as they are received by us from the Government of Bengal.

We have, &c.

(Signed)

LYTTON.

F. P. HAINES.

E. C. BAYLEY.

A. J. ARBUTHNOT.

A. CLARKE.

J. STRACHEY.

E. B. JOHNSON.

REPORT ON THE BACKERGUNGE CYCLONE OF OCTOBER 1876.

By J. ELLIOTT, Esquire, M.A., Meteorological Reporter to the Government of Bengal.

The following report deals with the cyclones which marked the transition from the south-west to the north-east monsoon during the month of October 1876. The first originated to the west of the Andamans, in latitude $14^{\circ} 30' N.$ and longitude $90^{\circ} E.$, on the evening of the 5th, and advanced across the Bay in a west-north-westerly direction, and reached the coast about twelve miles north of Vizagapatam, from which it passed slowly northwards, gradually breaking up to the north of Cuttack, in the Chota Nagpore district, but influencing and modifying the meteorology of Bengal and Upper India for some days after the dissolution of the vortex. The second cyclone vortex was generated to the west of the Andamans, in latitude $13^{\circ} 30' N.$ and longitude $89^{\circ} E.$, on the afternoon of the 29th, and advanced first almost due north, but was gradually deflected to the north-east, and struck the coast at the estuary of the Megna at 3 a.m. on the morning of the 1st, and was broken up a few hours afterwards by the disintegrating action of the Tipperah Hills. It influenced the weather in Eastern Bengal and Assam to a slight extent until the 3rd, when the north-east monsoon was finally fully established over Northern India and the head of the Bay.

The report, after a brief introductory chapter sketching the various theories which have been proposed to explain the formation and motion of cyclones, is arranged under the following heads:—

(1.) SECTION I.*—Gives the results of the observations for the month of October taken at the observatories in Bengal, Behar, and Orissa, and a few stations in the North-Western Provinces and Southern India. They are accurate and trustworthy, and it is from these mainly I have deduced the conclusions to which I have arrived, and from which they will admit of verification.

(2.) SECTION II.*—Deals with the Vizagapatam cyclone under the following chapters:—

Chapter I. gives the logs of six vessels involved in the cyclone, and special observations and information from Vizagapatam and its neighbourhood.

Chapter II. gives the meteorology of the Bay and Northern India before and during the cyclone, and traces out, from the information of the preceding section and chapter, the formation and line of advance of the cyclone vortex

Chapter III. gives a very brief summary of the cyclone, and discusses the causes and phenomena of the cyclone.

(3.) SECTION III.—Deals with the Backergunge cyclone, and is arranged under the following chapters:—

Chapter I.* gives *in extenso* the logs of 23 vessels involved in the cyclone.

Chapter II. gives the meteorology of the Bay and of Northern India prior to the formation of the cyclone, or from the 20th to the 30th October.

Chapter III. deals with the line of advance of the cyclone from its place of formation to the mouth of the Megna.

Chapter IV. investigates the path of the cyclone in Eastern Bengal until its disappearance under the action of the Tipperah Hills.

Chapter V. gives a brief account of the storm-waves which swept over the islands at the entrance to the Megna, and flooded the Chittagong, Noakholly, and Backergunge coasts.

Chapter VI. discusses the causes and phenomena of the Backergunge cyclone.

* This portion of Mr. Elliott's report has not been reprinted in the present paper.

INTRODUCTORY CHAPTER.—CYCLONE THEORIES.

A BRIEF recapitulation of the various theories which have been advanced to account for the phenomena and origin of cyclones will be useful, not merely for reference in the discussion of the recent cyclones, but also as showing the present practical and theoretical knowledge on the subject of cyclones. The observations hereafter given in detail will be employed partly to test the various theories.

The earliest writer of importance on the subject of cyclones was Mr. Redfield. Colonel Capper, in his observations on the wind and monsoons published in 1801, had stated his belief that the storms of the Indian Ocean were whirlwinds or rotatory storms. He stopped short at this anticipation, stating that "it would perhaps not be a matter of great difficulty to ascertain the position of a ship in a whirlwind by observing the strength and changes of the wind. If the changes are sudden and the wind violent, in all probability the ship must be near the vortex of the whirlwind; whereas if the wind blows a great length of time from the same point, and the changes are gradual, it may be reasonably supposed the ship is far from the vortex."

Mr. Redfield contributed a series of papers, dating from the year 1822, to American scientific journals, in which he developed the theory that they were vast progressive whirlwinds or rotating storms moving along curved paths. About the same time Professor Dove in Europe had come to the conclusion that all the phenomena of such storms are fully explicable by the assumption of one or more rotary atmospheric currents or whirlwinds advancing slowly in a definite direction.

The circular theory was also adopted by the next important writer on this subject, Lieutenant-Colonel Reid, of the Royal Engineers, in his work on the Laws of Storms. He not merely confirmed the results of the investigations of Mr. Redfield, but laid down, from examination of the tracks of a number of storms, the important generalization that in the rotary storms of the tropical regions of the northern hemisphere, the direction of rotation of the winds is N.W.S.E., or opposite to the direction of motion of the hands of a watch with its face upwards; whereas in the storms of the tropical regions of the southern hemisphere, the direction of rotation is the opposite—N.E.S.W. He was thus enabled to give a series of rules for the guidance of sailors navigating tropical seas.

Mr. Piddington took up a similar line of inquiry, and analyzed carefully the path of every storm in the Bay of Bengal and Indian Ocean of which he could obtain any records. He fully adopted the circular rotatory theory, and suggested the use of the word cyclone for all such storms. He gave an elaborate series of rules for the information and guidance of sailors navigating these seas:

But, as Mr. Buchan observes in his handbook on meteorology, it should always be remembered that in the charts given by Reid, Piddington, and others who adopt in its simplicity the circular theory, the arrows representing the wind direction are drawn always tangential to circles described about the centre of the area of calm solely on the assumption of the truth of the circular theory. They are hypothetical directions serving in their works a definite purpose, that of enabling them to lay down practical rules for sailors navigating seas visited by cyclones, and are undoubtedly a rough approximation to the actual character of the atmospheric motion during cyclones, which is what Sir John Herschel terms vorticose or spiral in its nature. Numerous synchronous storm charts, giving the absolute direction of the winds at the same instant, have been drawn by various meteorologists, and show that there is an indraught of air to the central region of calm as well as a rotatory motion. The combination of the two motions gives a spiral or incurving motion of the air towards the centre.

The upholders of the circular theory had thus seized only a part of the truth. The other element, the indraught or centripetal part of the motion, an important element, was left out of consideration. Mr. Espy, of Philadelphia, adopted this element to the exclusion of the other, laying down what is known as the centripetal theory. From personal observation of the direction in which the trees were lying on the ground after the tornado of the 19th of June in New Brunswick, he came to the conclusion that in this storm the winds must all have been blowing and converging to a centre. He afterwards adopted the theory of the converging motion of the air in the case of all cyclones to a centre caused by a rapid upward vertical motion at this centre, due to the vast amount of heat given out by the condensation of vapour and the subsequent fall of rain. He also laid down as a general rule that whenever a fall of rain is going on over a large

area, there is necessarily produced an upward motion of the strata in and above which condensation is going on, which is followed by an indraught from all directions in the lower atmospheric strata and an outdraught in the higher.

Dr. Dove meanwhile was devoting great attention to the subject of the meteorology of winds and storms. He elaborated the idea which underlay the explanation given by Hadley to account for the easting of the trades wind, and established what he termed the law of gyration. This is that, in consequence of the diminishing velocity of rotation at places of the earth's surface as we proceed from the equator to the poles, "in the northern hemisphere, when polar and equatorial winds succeed each other, the winds veer in the direction S.W.N.E.S., and in the southern hemisphere, when polar and equatorial currents succeed each other, in the direction of S.E.N. to S. He also explained on theoretical principles the opposite directions of rotation of cyclones in the northern and southern hemispheres. He also showed that the cyclonic movement of the wind was in all cases in accordance with the general principle underlying the law of gyration, and that it might be due to a mechanical obstruction, as a range of hills, or the resistance of another mass of air, or that it might result from the struggle of opposite currents which alternately displaced each other. The former is apparently his more matured explanation. The next theory of importance, that of Professor Taylor, adopted by Sir John Herschel in his work on meteorology, is a modification of Espy's Centripetal Theory and Dove's Law of Gyration. Cyclones owe their origin, according to this theory, to the action of local heat producing an upward expansion and vertical motion of the air over a limited area. This is followed by an indraught from all the neighbouring districts, which would be strictly in accordance with the centripetal theory, if the earth had no motion of rotation. The rotation causes these winds to be deflected in approaching the centre, and the result is an inner spiral motion round a centre, over which a continuous ascensional movement of the air is going on.

The latest authorities on the subject of cyclones in the Indian Ocean and Bay of Bengal are Messrs. Meldrum, Blandford, and Willson. Mr. Meldrum, who has made a lengthened study of the cyclones of the Indian Ocean, and has traced out a connexion between solar spot frequency and cyclone prevalence frequency, maintains that in the Southern Indian Ocean they are primarily due to the action of lateral parallel opposite currents of winds. In the intermediate belt between the opposite winds the mass of air is in a state of comparative calm, and in consequence of the friction on opposite sides, it gradually acquires a rotatory motion. In this theory the rotatory motion and the barometric depression at and near the centre primarily result from the action of the parallel and opposite winds. Mr. Willson maintained the same theory. His opinion, as given briefly in the report on the Meteorology of Bengal for 1874, is as follows:—"I have elsewhere stated that in the cases which I had been enabled to examine it appeared highly probable that cyclones in the Bay of Bengal, like those in the Southern Indian Ocean, were generated between parallel wind currents blowing in opposite directions, and that the determining causes were probably not local, but far removed from the place of the storm's origin; that, in fact, the unusual vigour of the opposing winds which precedes the generation of such storms is probably produced in the first instance by abnormally high pressure some 10 or 15 days beforehand on both sides of, but far removed from, the belt which afterwards becomes the battle ground of the opposite currents. In the case of the cyclone under report (the cyclone of 3rd to 5th May 1874) no doubt whatever can be entertained of the previous existence of the opposite winds, and it is equally certain that about eight days beforehand the pressures to the eastward and to the westward especially were very much above the average for the season."

The full explanation of his views and their extension to the October cyclones of the Bay of Bengal is given by Mr. Willson in his report on the Midnapore cyclone. The following extract will suffice to show its nature:—

"It appears to me that the theory of opposite currents, perhaps slightly modified in accordance with local circumstances, would account for the formation of this cyclone, as well as the local depression theory. The winds were N.E. over all the Bay north of latitude 17° , and W.S.W. south of latitude 15° . It seems therefore not improbable that long before the N.E. surface wind commences to blow with any strength, there is an upper N.E. current from the region of high pressure to the region of relatively low pressure. This current is drier, colder, and heavier than the opposing damp W.S.W. current, which must therefore be forced upwards along the belt where the winds collide and where the N.E. current descends. The W.S.W. current appears to be always the more powerful of the two. This fact is explained in the present instance by the high

pressure at Nancowry compared with the pressure over Bengal. However, it would seem probable that a very gentle N.E. current, or even a calm dense atmosphere would be sufficient to check and force upwards the powerful but less dense W.S.W. monsoon, thereby producing the enormous precipitation of moisture which is always observed near the place of the origin of a cyclone, and which probably plays a very important part in its formation. As the precipitation of moisture continues, the atmospheric pressure diminishes along the head of the W.S.W. monsoon. The north-easterly current hence becomes more vigorous, and gradually extends northwards as a strong surface-wind. Ultimately the N.E. current becomes sufficiently powerful to generate the cyclone. The above is a short sketch of how it appears to me the theory of opposite currents may be applied to account for the formation of the cyclones of the Bay of Bengal."

Mr. Blanford's theory is given briefly in an appendix to his paper on "The winds of Northern India." It is what has been termed the local depression theory. A calm state of the atmosphere, or one in which the winds are light and variable over the open sea, is the first condition favourable to the production of cyclones. The second condition is a high or moderately high temperature. The consequence of this combination of conditions will be the production and ascent of a large quantity of vapour, which will be condensed with the liberation of its latent heat over the area of its production, instead of its being carried away to some distant origin. If this state of things last for some days, the atmospheric pressure will be locally lowered, causing, or tending to cause, an indraught of air towards the place of minimum pressure. One further condition appears to be essential. The actual formation is finally determined by the inrush of a saturated stormy current from the S.W. or W.S.W.

CHAPTER II.—METEOROLOGY OF NORTHERN INDIA AND THE BAY OF BENGAL FROM 10th OCTOBER TO 31st OCTOBER.

THE easterly winds which prevailed in Upper India after the breaking up of the Vizagapatam cyclone continued until the 18th or 19th, gradually decreasing in force. They were accompanied by rainfall over the whole of Upper India, from Bengal westwards to the Punjab. The rainfall over the Bay of Bengal, judging from the returns of Port Blair, Nancowry, and the coast stations, was during this period very slight.

The barometer, which before and during the breaking up of the Vizagapatam cyclone had been abnormally low, rose rapidly on the 11th, 12th, and 13th, and during the next 10 days was from '1" to '13" above the average. The causes of these variations of pressure of long period are as yet very imperfectly known. They are intimately connected with oscillations of temperature, the changes of one, when the variations in the amount of aqueous vapour in the air are small, being inverse to the other—that is, a continuous fall of the mean daily temperature is associated with a continuous rise of the barometer, and *vice versa*. The temperature of Upper India after the Vizagapatam cyclone was very considerably below the average, falling rapidly from the 10th.

The following tables illustrate the two facts of diminished air temperature and increased atmospheric pressure over Northern India at this time:—

Stations.	Mean Pressure, 10th to 20th October.		Mean Pressure, 10th to 20th October 1876.	Variation from Mean.
	Years.	Average.		
Roorkee - - - - -	17	28·924	29·037	+·113
Agra - - - - -	17	29·254	·355	+·101
Lucknow - - - - -	17	·437	·552	+·115
Benares - - - - -	17	·578	·651	+·073
Patna - - - - -	8	·688	·746	+·058
Calcutta - - - - -	8	·834	·919	+·085
Sibsagur - - - - -	3	·569	·654	+·085
Akyab - - - - -	8	·828	·954	+·125
Port Blair - - - - -	9	·746	·895	+·149
Madras - - - - -	7	·827	·925	+·098

Stations.	Mean Temperature, 10th to 20th October.		Mean Temperature, 10th to 20th October 1876	Variation from Mean.
	Years.	Average.		
Roorkee	17	76·2	71·6	-4·6°
Agra	17	82·1	75·3	-6·8°
Lucknow	17	79·7	74·3	-5·4°
Benares	17	80·8	76·5	-4·3°
Patna	8	80·1	75·9	-4·2°
Calcutta	8	82·2	80·3	-1·9°
Sibsagar	3	76·8	72·6	-4·2°
Akyab	8	81·5	80·2	-1·3°
Port Blair	9	79·8	80·7	+·9°
Madras	7	78·6	83·1	+4·5°

The humidity, more especially in the North-West Provinces, was above the average. The last rainfall in these provinces and in Behar was on the 18th and 19th, after which the dry cool weather which follows the rains set in. The wind direction and velocity during this period show the prolonged intrusion of the monsoon current in Upper India. The easterly and south-easterly winds which were prevalent over the Gangetic Valley from the 10th gradually diminished in intensity until the 19th, when they were succeeded by the cold-weather opposite current. But during the period of transition from the 19th to the 21st of the month there was a condition of calm and almost perfect atmospheric equilibrium over the whole of the Bay of Bengal and Northern India. The wind velocity at a number of stations for these two days is given in the following table :—

Stations.	Wind Velocity.		Average daily Wind Velocity.			
	19th October 1876.	20th October 1876.	Months of July, August, and September.		Months of October, November, December, and January.	
			Years.		Years.	
Roorkee	31·1	26·2	4—5	65·5	5	35·5
Lucknow	53·0	41·0	3	76·6	4	39·2
Patna	44·2	39·2	4—5	93·7	5	55·9
Calcutta	44·4	68·3	8	103·4	6—8	91·4
Sagar Island	105·0	114·5	5	253·4	4—5	124·9
Madras	109·0	179·0	5	225·1	5	191·5
Nancowry	7·3	42·7	3	290·5	2—3	190·2
Akyab	41·0	39·0	4	72·1	3—4	57·3
Dacca	30·3	48·0	7	152·7	7	49·5
Sibsagar	31·0	41·4	2	73·9	2	40·9

The meteorological features of Northern India and the Bay were consequently at this time very simple and clearly marked. Increased atmospheric pressure (from ·1" to ·15" above the average) and diminished temperature over the greater part of the land area accompanied the almost quiescent state of the atmosphere which characterised the period of transition from the south-west to the north-east monsoon. What is, however, more important in the discussion of the causes of the cyclone is the near approach to equality of pressure over the whole of this area at this time. Thus on the 20th the barometric difference between Nancowry and Madras was only ·011", between Nancowry and Sagar Island ·021", and between Nancowry and Roorkee (a distance of 1,700 miles) only ·047". These differences are so small that, if the moving mass between the two last stations were water instead of air, it would be equivalent to a difference of pressure spread over the interval of 1,700 miles of $\frac{1}{40}$ of a lb. on the square inch, or a head of ·6 inches. Even taking into account the small density of air, the reversion of the current at this change of the monsoons over India and the Bay of Bengal cannot be primarily assigned to the small differences of pressure which actually existed within the geographical limits of India.

So far then as our meteorological knowledge goes, there was at this period as near an approach to an almost perfect equilibrium of meteorological conditions and actions over a large area as probably ever obtains. At such a time, as I have already indicated in the discussion on the Vizagapatam cyclone, if the conditions are such as to favour the gradual retreat of the south-west monsoon southwards, and the establishment of the north-east trade wind over India, the formation of a cyclone and its advance northwards or

north-westwards is impossible. If, however, the pressure is high to the south of the Bay of Bengal, from the existence of any of the various causes which might produce excessive pressure near the equator, the south-west monsoon will continue to prevail in the lower portion of the Bay, and the formation of a cyclone becomes not merely possible, but certain, if the conditions last long enough.

In the former case of the establishment of the north-east trade wind over the whole of the Bay, the vast quantities of aqueous vapour produced by evaporation are carried away to the south-west, to give rain to the Madras coast, Southern India, and other regions further south. In the latter the aqueous vapour due to evaporation in the Bay has no horizontal outlet, the north-east and south-west winds on opposite coasts indicating that at this time the atmosphere is in the condition of a land-locked area; hence the only possible motion of the vapour is that of vertical ascent or expansion. There thus commences almost immediately a vertical current, or an expansion followed by condensation and rainfall, over the area of production. The holding off the rains during this month along the Coromandel coast favours this assumption in the present instance. The rainfall at Madras for the month was 1·04", of which only ·4" fell during the last fortnight. The average rainfall for the month during the period 1822–1843 was 10·09".

The high pressure to the south of the Bay which accompanied the continuance of the south-west monsoon in the south of the Bay is indicated by the logs of three vessels. The captain of the "Tennyson" states that from the equator to latitude 10° N. he had light baffling winds, with a high barometer. Captain Piton, commander of the ship "Lightning," in his remarks, says that he crossed the equator on the 12th, and advanced very slowly northwards, reaching latitude 9° 17' N. on the 23rd; and that during this interval he experienced very light winds and calms, with showers of rain and hot sultry weather, the sun being so hot as to boil the pitch out of the seams of the deck. The "City of Venice" passed round Ceylon on the 26th. Her log from the 21st shows that in the Arabian Sea, in the same latitudes as Port Blair and Nancowry, the pressure was unusually high, and that the weather up to the 25th was fine and clear, with light breezes. On the 25th, to the west of Ceylon she had variable and light winds with unsettled weather, showing the transition from the region of high pressure and fine weather on the south and west to the area of disturbance in the Bay of Bengal.

These extracts from the logs of the three vessels seem to be sufficient evidence to establish generally the fact of an excess of pressure, due to some unknown action, at and near the equator. It is further confirmed by the returns from the Ceylon stations, which show that the pressure over the island was on the 19th and following days from ·06" to ·09" above the average. This excess of pressure, usually not large in amount, north and south of the area of cyclone generation prior to the formation of a cyclone was pointed out by Mr. Willson as a marked feature of the Midnapore cyclone, and by Mr. Blanford as accompanying the barometric depression in the Bay which preceded the Calcutta cyclone of 1867.

I shall now proceed to discuss the meteorology of the Bay and Upper India day by day, with the aid of the small charts (Plate II.) These give the isobars either for the day, as in the case of the charts from the 20th to 29th, or for the actual hour of observation indicated on the charts, as in the case of the 30th, 31st, and 1st, together with synchronous wind observations at the various observing stations at 10 a.m. in the case of the charts up to the 29th, and after that day of the hour named on the chart. The wind directions in various parts of the Bay are derived from the logs of the vessels traversing the Bay and given *in extenso* in the preceding chapter.

October 20th.—The isobars in the chart for this day indicate, what has been already pointed out, the near approach to equilibrium of pressure over the whole of this region. The winds generally show the usual cold-weather direction, the motion of the air being from Upper India to the Bay, over which there was a gentle flow to the south or south-west.

October 21st.—The isobar of 30·00 had during the previous 24 hours advanced down the Gangetic Plain as far as the great bend of the Ganges, but retreated slightly from the Orissa coast. The pressure in the centre and south of the Bay of Bengal was diminishing during the day. The decrease at Port Blair and Nancowry was ·035" and at Vizagapatam ·024'. In Ceylon the pressure on the western coast was slightly greater than on the preceding day, and on the eastern coast at Trincomalee it was ·046" less. The most important circumstance connected with this decrease of pressure was the re-establishment of south-westerly winds at Nancowry; and along the coast from Chittagong to Vizagapatam the easterly element of the wind became more strongly

marked. There was thus around the coast a tendency to a cyclonic motion of the air. The wind velocity, however, continued to be very small, averaging from two to four miles an hour, and was greatest at the embouchure of the Ganges, where the currents down the Assam and Gangetic valleys passed seawards. Also, with the re-establishment of the south-westerly current and its extension northwards began a period of almost continuous drizzling rain at Nancowry, Port Blair, and Ceylon.

October 22nd.—The chart for this day gives the isobars of mean pressure and the wind directions at 10 a.m. In Upper India and the northern half of the Bay the atmospheric state was almost identical with that of the previous day, whilst in the south of the Bay the pressure continued to diminish. At Port Blair the mean pressure for the 22nd was '022" less than that of the 21st, whilst at Nancowry it had fallen '016." The pressure at Port Blair was now '010" less than Nancowry. This is the first evidence of the commencement of an area of barometric depression to the north-west of Nancowry, which became more and more intense during the next five or six days, and from which the cyclone of the 30th and 31st had its origin. The pressure in Ceylon increased during the day, and it was now from '05" to '09" above the average. The wind velocity in Upper India and along the western coast and in Ceylon was very small. At Nancowry during this and the next three days it increased from an average of $1\frac{1}{2}$ miles to 3 miles per hour.

October 23rd.—The isobars for this day show a slight increase of pressure in Northern India, the isobar of 30·00 having advanced almost parallel to its former direction, 120 miles to the eastward, during the preceding 24 hours. The isobar of 29·95, as on the previous day, ran across the Bay from Akyab to Madras. In the south of the Bay the decrease of pressure continued. The fall during the preceding 24 hours at Port Blair was '019" and at Nancowry '022". It was, however, still slightly in excess at the latter station. The diminution of pressure over the island of Ceylon averaged '025". Thus the area of low pressure still occupied the same position as on the previous day, the baric difference between its centre and Northern India being now considerable, probably '15". The wind directions present no new features, except at Port Blair and Nancowry, where they show a tendency towards a cyclonic movement round the area of low pressure.

October 24th.—The chart for this day shows the continuation of the increase of pressure in Northern India. The isobar of 30·00 had advanced still further eastwards and included a small portion of the deltaic area. The pressure over the whole of Upper India was now very largely in excess of its normal amount. The position of the isobar of 29·95 was almost identical with its position on the previous days, the 22nd and 23rd. In the south-east of the Bay there was a slight increase of pressure, which was greater at Port Blair than at Nancowry. The mean pressure was also now very slightly greater at Port Blair, but the continuation of the same winds as on the previous day indicates clearly the persistence of the area of depression to the north-west of Nancowry, and the gradual development of a cyclonic movement of the air round this area.

October 25th.—The pressure during the day diminished slightly over the whole of Bengal and Northern India, the isobar of 30·00 now running north-west and south-east from False Point to Patna. The isobar of 29·95 occupied the same position as on the previous days, being a sort of fulcrum, about which the changes of pressure were taking place. The pressure at Port Blair fell '008, whilst at Nancowry it was increasing. Judging from this and the wind direction at Port Blair and the distribution of pressure on the succeeding days, it is probable that the area of barometric depression had now begun to extend or advance northwards. At all the Ceylon stations, except Trincomalee, there was a slight increase of pressure. Up to this date the north-easterly winds along the west coast of the Bay extended as far south as Ceylon. The wind velocity at the stations along the coast and in Ceylon and Upper India showed the continuance of very moderate breezes up to the evening of this day. The log of the "Tennyson," which was passing up the Bay, throws some light on the meteorology of the centre of the Bay and the region of diminishing pressure to the north-west of Nancowry. She had light winds from the west and a steady barometer until the 26th, when she was in latitude 13°, and after that date light breezes and a clear sky until the 29th, when she was overtaken by the cyclone, which had formed in the area over which she had passed three or four days previously. The "Lightning" passing over this area on the 23rd and 24th, had very hot, but fine weather, with very light winds and occasional showers. The barometers of these vessels have not been compared with the Calcutta standard, but from a rough comparison of their readings when the vessels were passing up the river to Calcutta with the Sagar Island and Calcutta barometers, it is probable that

at this period the lowest pressure in the Bay was to the north-west of Nancowry, and was not below 29·85". The "Forfarshire" was in latitude 11° 30' N. and longitude 90° 30' E. at noon of this day. The reading of her barometer at that hour corrected to the Calcutta standard was 27·879, and on the 28th at noon, when in latitude 18° 30', it was 29·829. This, and the fact that no fall of the barometer is noticed in her log, seem to establish conclusively that over the central area the pressure was as yet very slightly less than around the coast, and that its diminution was proceeding at a comparatively slow rate.

October 26th.—The chart of this day presents a continuation of the changes which began on the previous day. The atmospheric pressure was still diminishing over Northern India. It was now less than 30·00" over the whole of India, except in the eastern part of Assam and to the west of Bareilly and Meerut in the North-West Provinces, and Punjab. The isobar of 29·95 had also advanced to the west, and now passed through Dacca, to the east of Sagar Island, across the north-western angle of the Bay, meeting the coast again probably midway between Vizagapatam and Madras. In the south of the Bay the pressure at Port Blair continued to indicate diminishing pressure over the adjacent sea area. The fall at Port Blair during the preceding 24 hours had been ·015". This continued gradual diminution of pressure is partially confirmed by the statement of the captain of the "Tennyson" (advancing northwards about 250 miles to the westward of the Andamans) that his barometer fell on this day two-tenths of an inch. The wind directions at Nancowry (which had now changed from south-west to south-east), at Port Blair, and of the ship "Tennyson," now define the area of diminishing pressure more exactly. The centre was probably about 180 miles to the north-west of Nancowry, and the lowest pressure probably still exceeded 29·75. To the north and west of this area the winds were undoubtedly north and north-east (as shown by the log of the "Tennyson"), the weather fine and sky unclouded, whilst on the east and south-east the winds were south, south-east, and east, and accompanied with continuous rainfall. In Ceylon the easterly element in the wind during the previous five days began to be replaced by a westerly element, indicating the transition from the north-east winds to westerly and south-westerly winds, which were fully established on the following day over the island. The returns of Port Blair and Nancowry and the Ceylon stations and the log of the "Tennyson" seem to establish the fact that the rainfall was not as yet excessive. The rainfall at Port Blair for this day was ·71" and at Nancowry ·75". This was, however, the first day since the 10th on which rain in any considerable amount had fallen at these two stations. The character of the wind was now, however, rapidly changing. Hitherto there had been moderate winds with slight drizzling rain. The wind velocity at Nancowry, which had been 64·0 miles on the 25th (or 2·5 miles per hour) and 48 miles on the 24th, increased on this day to 254·1 miles, giving an average of 10·6 miles per hour. This sudden increase evidently indicates a powerful indraught of saturated air from the south into the region of low pressure. The "City of Venice" was at this time passing along the southern and eastern coasts of Ceylon, and experienced light breezes and heavy rain, with occasional squalls and unsettled weather. The wind velocities for the day at the Ceylon stations indicate the same fact, that in the south-west of the Bay the winds were very moderate, and indicated as yet no violent inrush from this direction.

October 27th.—The chart shows a very general decrease of pressure from the preceding day, averaging in amount over the whole of Northern India from ·04" to ·05", and in Eastern Bengal ·025". The isobar of 29·95 now passes in a very curved line from False Point to Berhampore, and thence westward to Allahabad; whilst the isobar of 29·90 occupies the same position as that of 29·95 did on the 24th and 25th, running across the Bay between Akyab and Madras. The isobar of 29·85 encloses an area to the north-west of Nancowry, and marks the persistence of the area of diminishing pressure. The meteorology of this portion of the Bay is now partially illustrated by the logs of five vessels—the "Empire of Peace" and "British Sceptre," which were on the south-east, the "Arabia" in the centre, the "Tennyson" on the north, and the "City of Venice" on the south-west of the area.

The "Empire of Peace" and "British Sceptre" were running north along the meridian of 92°, and were within a few miles from each other on this and the following days; the "British Sceptre" experienced strong breezes during the day and a deluge of rain; whilst the "Empire of Peace" reports thick cloudy weather with much rain, the wind varying from south-west to south-south-west. The rainfall at Nancowry (120 miles to the S.E. of these vessels at noon) was ·88 inches, and at Port Blair 1·92 inches. There was thus during the day heavy rainfall on the south and east quadrants of the area of diminishing pressure. The returns of Port Blair and Nancowry on this and the

following days suggest a considerable, but not an excessive rainfall (accompanied with a strong wind) over the whole of this area. Probably the rainfall at no part of it exceeded two or three inches, and the expression "a deluge of rain" must be taken as descriptive rather of an irregular intermittent violent rainfall than of one abnormally excessive in amount. The "Arabia," almost due east of Port Blair at noon, and advancing northwards to Calcutta along the meridian of 89° , had constant rain during the day, with a gradual change of wind direction from west through south to south-south-east, as she progressed northwards. The corrected reading of her barometer at noon was 29.512. She was in the same latitude, but at some distance further west than the "Forfarshire" was on the 25th, when the corrected reading of her barometer was 29.829. A considerable diminution of pressure had therefore taken place over this area during this interval. During the morning she experienced two squalls from the north-east, showing the commencement of the rapid indraught of air on the northern side of the region of diminishing pressure. The logs of the "Tennyson" and "Forfarshire," in latitude 16° and some distance north of the "Arabia," show the continuation there of the north-east monsoon, with clear weather and a steady moderate breeze. The wind velocities of the coast stations present little change from the 20th, and furnish no evidence of any extensive indraught to the centre or south of the Bay. At Nancowry the velocity was in excess of the previous day, 310.8 miles being registered during the day. This proves the continued indraught into the region of depression, and also what is important, that its centre was still at no great distance from Nancowry, and that it had probably not moved northwards to any considerable distance during the preceding 24 hours. There was a very slight increase in the wind velocities of the Southern Ceylon stations. Some of the wind directions in Northern India seem to be anomalous, but they probably indicate local winds, due to small differences of the pressure, or to slightly different atmospheric conditions over limited areas, and confirm the existence and continuation of the condition of almost uniform atmospheric pressure over the land area.

October 28th.—The chart for this day shows a further diminution of pressure over the whole area north of Nancowry, where the mean pressure was the same as on previous day. The isobar of 29.95 has again advanced up the Gangetic valley, and runs between Lucknow and Agra on one side and Allahabad on the other. The isobar of 29.90 crosses the head of the Bay from Chittagong to the coast south of Vizagapatam. The pressure at Ayab and Chittagong were on this day relatively very low to the adjacent coast stations. The pressure at Port Blair was .022" less than on the previous day. This and the readings of the barometer on board the "Arabia" on the previous day prove that the diminution of pressure was now proceeding at a more rapid rate over the area of diminishing pressure to the north-west of the Nicobars and west of the Andamans. The corrected reading of the "Arabia's" barometer at noon of this day was 29.551" (.039" higher than on the previous day, indicating that she was then advancing more rapidly northwards than the extension of the area of barometric depression). The pressure along the west coast of Ceylon was still above the average, whilst the variations were small in amount. Along the east and south coast the changes were much larger. The range of the mean barometric pressure at Colombo from the 20th to the 31st was only .09", whilst at Trincomalee it was .16".

The wind to the south of Ceylon was almost due west, at Nancowry south-west, and at Port Blair and to the west of it, as shown by the logs of the "Allahabad," "Empire of Peace," and "British Sceptre," all within a few miles from each other, south-south-east. The logs of the "Tennyson" and "Forfarshire" state that at the head of the Bay the wind was north-east, and the "City of Venice," to the west of the area of depression, that it was there north-north-east. Thus there was a decided cyclonic circulation round the area of diminishing pressure. The "Arabia," nearest the centre, had squalls from the S.E., a high sea and constant rain.

The rainfall at Port Blair and Nancowry during the day was not large in amount; .34 inches were recorded at Port Blair, and .14 at Nancowry. The ship "British Sceptre" reports torrents of rain, alternately warm and cold; the "Empire of Peace," strong breezes with much rain; and the "Allahabad," constant rain with very heavy squalls. These vessels were all to the west of the Andamans on this day. The steamer "Japan," passing along the east coast of Ceylon, reports squally winds from the west, with light rain. The log of the "City of Venice" for this and the following day is especially interesting, as it shows the gradual change of the weather which

preceded and accompanied the formation of the cyclone. Early in the morning there were frequent squalls of wind and rain, attended with vivid lightning and heavy thunder. At noon there was a fresh breeze with heavy squalls of wind and rain and a confused sea. At 8 p.m. there was a fresh gale with heavy squalls and a high cross sea, whilst at midnight there were hard squalls with bad looking weather. The "City of Venice" was during the day to the south-west and west of the centre of the area of low barometer. The "Tennyson" and "Forfarshire," in latitude 18° N., state that the weather became gradually unsettled during the day, and that a swell set in from the southward which gradually increased in strength. These facts all tend to prove that the area of low barometer and diminishing pressure was extending northwards, that the amount of the depression was steadily increasing, and that over this region of diminishing pressure the weather was rapidly becoming worse; whilst the wind directions and the frequency of squalls show that the disturbance was also acquiring all the characteristics of an extensive and violent cyclone.

The amount of wind registered at Nancowry during the day was only 29·9 miles, confirming the supposition that the centre of the area of depression had advanced considerably to the northwards during the preceding 24 hours. The wind velocity at all the coast stations, including Madras, was very small on this day, giving no indication whatever of the violent squalls in the mid bay. The wind returns for Galle, Colombo, and Trincomalee show a slight increase of the velocity of the westerly indraught to the region of low pressure.

October 29th.—The chart for this day indicates that a considerable change had taken place in the distribution of pressure in Northern India, over the whole of which it had increased by amounts varying from ·03" to ·05".

The isobar of 29·95 is now parallel to the head of the Bay, and at a distance of 150 miles from it. The isobar of 29·90 runs to the south of Akyab and Chittagong, showing increase of pressure at the north-eastern angle of the Bay, whilst it has advanced on the opposite coast as far north as False Point.

The isobar of 29·80 includes a closed area occupying the greater part of the Bay, the centre of which continued to be a region of steadily diminishing pressure. The pressure at Port Blair and Nancowry was ·015 higher than on the preceding day. The centre of this area of depression and atmospheric disturbance, which was increasing by northward extension, as well as by the slow advance of the centre northwards, was on the afternoon of this day probably almost due west of Port Blair. The wind directions given in the chart for 10 a.m. indicate clearly the position of this area and its centre.

The corrected reading of the barometer of the "Arabia" at noon is 29·45. The barometers of the other ships within the disturbed area all indicate decrease of pressure, but do not afford sufficient data to determine the minimum pressure at this period.

The rainfall at Nancowry and Port Blair was still moderate in amount.

The ship "British Sceptre" reports torrents of rain and hard squalls; the "Empire of Peace," thick rainy weather; and the "Allahabad," constant rain with very heavy squalls. These vessels were on the north-eastern quadrant of the advancing storm and incipient cyclone. The "City of Venice," in latitude 14° N. and longitude $85^{\circ} 30'$ E., was advancing north with the storm during the early part of the day, and was in the north-western quadrant. She experienced early in the morning a moderate gale with continuous rain, and a high cross sea from the east. At noon the gale was increasing, blowing in hard squalls. The ship was reduced to half speed at 2 p.m. At 4 p.m. and during the remainder of the day the wind blew a hard gale with furious squalls from north-east and north-north-east, and rain, whilst the sea became more and more confused, causing the ship to labour and pitch heavily. The log of the "Arabia," which was in latitude $14^{\circ} 19'$ N. and longitude $89^{\circ} 30'$ E. at noon, confirms the evidence of the "City of Venice." She had during the day gloomy weather, a violent wind with strong squalls at intervals, and torrential rain. The atmospheric disturbance was thus rapidly intensifying and developing into a cyclone.

The "Tennyson," "Forfarshire," and "Lightning," were all approaching the mouth of the Hooghly, and experienced the gradual northward extension of the disturbance. The "Tennyson," farthest to the south and in latitude $18^{\circ} 20'$ N. at noon, had early in the morning squalls from the east with rain. The weather during the day became worse, and the swell from the south increased and rolled up heavily. The "Forfarshire" and "Lightning," 80 miles further north, had fair weather in the morning with a moderate breeze, but it changed rapidly during the afternoon, becoming unsettled and

squally with rain. At Madras there was calm clear weather. The steamer "Japan," 200 miles to the south-east, had a strong west-north-west wind during the day, cloudy weather with squalls, whilst towards evening there was every appearance of a gale.

The evidence furnished by the logs of the vessels, combined with the observations at the observatories at Port Blair, Nancowry, and the coast stations, establish clearly that the change from the larger and more general disturbance over the greater portion of the Bay and its intensification and development to a cyclone, took place during the afternoon and evening of the 29th and morning of the 30th. This change, moreover, was a mere expansion or development due to the continuance and insistency of the very same causes which had produced the diminishing pressure over the mild Bay, and not to the sudden inrush of a strong current from any neighbouring region south or north. The history of the advance of the cyclone from the morning of the 30th until its final breaking up amongst the Tipperah Hills is given in separate sections.

The following gives briefly the meteorology of the land area to the north of the Bay during the advance of the cyclone on the 30th and 31st up the Bay to the estuary of the Megna:—

October 30th and 31st.—The charts for these days give the synchronous (corrected and reduced) barometer readings and wind directions at the various observing stations, and illustrate the rapid changes of pressure round the coast and in Bengal due to the advancing cyclone. The probable position of the vortex is shown on each chart by a small circle.

The wind directions show clearly the general cyclonic character of the winds at this time over the whole of the Bay of Bengal and Northern India. The wind velocity in the North-West Provinces and Behar was on the 30th small in amount, averaging from half a mile per hour to $2\frac{1}{2}$ miles. It was increasing rapidly at False Point, 161·5 miles being registered. The wind velocity at Sagar Island showed a slight decrease from the previous day. At the land stations in Bengal and Assam there was a slight increase. The wind returns of False Point alone distinctly showed the approach of the cyclone.

The humidity and amount of aqueous vapour in the air increased considerably during the day, and a slight rainfall after a break of nine days occurred in the Burdwan Presidency, Dacca, and Chittagong Divisions, and on the coast of Orissa and in Assam. In Behar the sky was slightly clouded.

The wind velocities in the North-West Provinces and Behar on the 31st were almost identical with those of the previous day, and indicated very gentle breezes over this part of India. The number of miles registered at False Point was 232·2, and at Sagar Island 527·6, an average of 22 miles per hour. The returns of all the stations round and near the coast of Bengal show increasing velocity of the wind with the approach of the cyclone. The humidity was high during the day, and slight showers of rainfall occurred over the same districts as on the previous day. In no case, however, was the rainfall at all large in amount, the only rainfall exceeding an inch occurred at Khoohna, in the Jessore distriat. The rainfall at Nancowry on the 30th was 0·53", and on the 31st 0·32". For the same two days at Port Blair it was 1·38" and 0·31" respectively.

The pressure diminished over the whole of Ceylon on the 30th by amounts varying from ·009" to ·061", the fall being greatest at Colombo. It increased on the 31st at all stations except along the north-east. The wind during this period was from the west and south-west, the velocity at the coast stations showing a slight increase on the 31st. The greatest amount was recorded at Galle on the 31st, when 257·5 miles were registered.

CHAPTER III.—THE PATH OF THE CYCLONE IN THE BAY OF BENGAL.

The preceding section has shown that from the 21st a state of circumstances such as I conceive to be favourable to the formation of a cyclone had prevailed over the Bay. There was great uniformity of pressure on that date over the whole of the Bay, whilst the moderate north-east and south-west winds which were blowing on opposite sides of it prevented the dispersion of the aqueous vapour in the lower atmospheric strata towards the neighbouring regions, more especially the land area of Southern India. This had been followed from the 23rd by the formation of a region of diminishing pressure in the Bay to the north-west of the Nicobars, and by rapid condensation of vapour over that part of the area of evaporation which was to the south and south-east of the centre of the region of barometric depression. This state of things continued, and gradually intensified

in character; the weather became more unsettled and squally, the rainfall on the south-eastern quadrant increased, whilst a strong indraught set in from the south-west on the 27th and 28th, and a weaker indraught on the north. These are all proofs that the area of diminishing pressure gradually extended northwards, and that the amount of the depression increased, at first slowly, and afterwards with accelerating rapidity, owing to the prolonged persistence of the causes and the accumulation of the effects. The centre of the area of depression was probably in latitude 10° N. and longitude 89° E. on the 27th, and was then moving very slowly northwards. It was in latitude 13° N. and longitude 89° E. at noon of the 29th. There was a gale, cyclonic in its character, on this day in the area of depression, but the true cyclone appears to have been the further concentration of this cyclonic motion on the evening of the 29th and morning of the 30th. All the circumstances which had favoured the formation of the cyclonic disturbance up to the 29th still continued, and it is probable that the true cyclone, although formed on the evening of the 29th, did not acquire its full intensity until the afternoon of the 30th.

The S.S. "Japan," on the evening of the 29th, in latitude 11° N. and longitude 84° E., experienced a moderate gale and squally weather with heavy rain. She was at this time running parallel to the path of the cyclonic disturbance. The slight changes of wind (west-north-west to west) show that she was in the south-western quadrant at a very considerable distance from the centre. During the early part of the morning of the 30th she apparently was advancing northwards more rapidly than the cyclone, and approaching it, for at 7 a.m. the gale was freshening and the ship labouring from the heavy confused sea. There was also a very heavy bank of clouds forming to the north and north-east. The engines were then eased to dead slow until 5.30 p.m., during which the gale gradually moderated. They were again set at full speed at 6.30 p.m. The ship was now well in the rear of the storm, and the weather slowly improved. The "Japan" was probably nearest the centre at noon of the 30th, when in latitude $12^{\circ} 9'$ N. and longitude $85^{\circ} 30'$ E., but the very slight fall of the barometer during the previous 36 hours show that she was at a very considerable distance from the vortex. The centre was then to the north-east, and probably at a distance of 270 miles. This would give its position at noon of the 30th as in latitude $14^{\circ} 30'$ and longitude $89^{\circ} 15'$.

The log of the S.S. "City of Venice" shows that she was within the outer limits of the area of cyclonic disturbance on the evening of the 29th and the morning of the 30th. At midnight of the 29th she was steaming very slowly north (in latitude $14^{\circ} 40'$ N. and longitude $85^{\circ} 35'$ E.) amidst a hard gale, the force of which varied from 7 to 9, with fierce squalls of rain and spray. At 9.20 a.m. of the 30th the weather was so threatening that the ship's head was turned to the south-west for several hours, and she rapidly passed away from the cyclonic area. At 2.30 p.m. the ship was brought to and turned to the north-east. She then advanced almost parallel to the path of the cyclone, and continued for the remainder of the day in its outer limits. The changes of the wind and the barometric readings indicate that she was nearest the centre at midday of the 30th. The vortex was at this time probably almost due east, and in latitude $14^{\circ} 30'$ and longitude $89^{\circ} 10'$, assuming, from the amount of the fall of the barometer, that the vessel was 210 miles from the centre. The logs of these two vessels thus give approximate positions for the centre substantially agreeing with and confirming each other.

The S.S. "Penang" is the next vessel in order of time which was involved in the cyclone. She was steaming southwards, having left Calcutta on the 28th, and was rapidly approaching the cyclone on the 30th, experiencing rough weather during the greater part of the day. The wind increased rapidly during the evening. The sea broke over the vessel, washed away the starboard cutter, and burst open the starboard saloon door, flooding the saloon with water early in the evening at 8 p.m. The barometer continued to fall until 4 a.m. of the 31st, from which to 7.30 a.m. it varied very little. At 7.30 a.m. the whole of the front of the saloon was stove in, and the ship lay like a log, with the saloon full of water, whilst the sea continued to break over her and reduced her to a perfect wreck on deck. The weather began to moderate from this time, and the cyclone passed on, leaving the "Penang" in so disabled a state as to be compelled to return to Calcutta. Her position at the worst of the cyclone is stated in the log to have been $17^{\circ} 30'$ N. and $86^{\circ} 50'$ E. If this position is correct, the position of the vortex can be approximately ascertained on the morning of the 31st. As no readings of the barometer are given for the day on which the "Penang" left Calcutta, it is impossible to ascertain even roughly whether the instrument was comparable with the Calcutta standard, or what its error was. The slight fall of her barometer from 2.30 a.m. of the 30th to 4 a.m. of the 31st ($\cdot 18''$) shows that she was at least 150 to 160 miles distant from the vortex, which was therefore in latitude $17^{\circ} 45'$ N. and

longitude $89^{\circ} 13' \text{ E.}$ at 7.30 a.m. of the 31st. This would give an average rate of advance from midday of the 30th of nearly nine miles per hour.

The "Scottish Chieftain" arrived at the head of the Bay on the 29th, and was unable to obtain a pilot on account of the heavy sea. She stood off to the south-east on the 30th. The gale increased rapidly in violence; the reading of the barometer at midnight, corrected to Calcutta, was 29.578. The wind at this time came from north-east. The barometer fell very quickly from midnight to 3 a.m. of the 31st, when the corrected reading was 29.161. The vessel was then in the north-western quadrant, and stood off to the south-west to avoid the centre. From 4 a.m. the wind blew in terrific squalls accompanied with constant rain, and at 10 a.m. was blowing a hurricane from the north. Shortly after this, at 11.30 a.m., it was found necessary to cut away the fore-topmast backstays, when the fore-topmast went over, carrying with it the main-topmast, mizzen, and top-gallant masts. The barometer at midday fell to 28.962, about which time the centre of the cyclone was passing to the east of the vessel, probably in latitude 18° N. and longitude 89° E. The wind at 4 p.m. was from north-north-west, and the barometer rising; the wind backed to the west at 8 p.m., after which the weather rapidly moderated. In this case, as in the logs of the pilot vessels, the "Foam" and "Coleroon," no latitude observations were taken during the storm, and hence their logs are mainly useful in confirming the path assigned to the cyclone from the logs of other vessels.

The log of the "Tennyson" gives the next position of the centre of the cyclone in order of time. She was proceeding towards the mouth of the Hooghly along the meridian of 89° , and was overtaken by the cyclone late on the evening of the 30th. The fall of the barometer up to the afternoon of the 30th had been so slight as to give no indication of the impending cyclone. The increasing swell from the south and the threatening appearance of the sky were the first signs of its approach. The wind was strong during the whole day from east-north-east, and at 10 p.m. began to blow in furious gusts. This was followed by rain in torrents for an hour, succeeded by a few minutes' calm, during which the confused sea was tumbling about in heaps in all directions. The first burst of the cyclone passed over the vessel with a roar like thunder, throwing the ship on her beam-ends until the first rush was past, when she righted. The barometer at midnight stood at 29.6, and fell rapidly with the advance of the cyclone until 1.30 p.m. of the 30th, when it was 28.15. During the earlier part of the cyclone, when the wind was comparatively steady, the "Tennyson" suffered very little damage from the heavy sea; but on the near approach of the vortex, with the more rapid changes of wind and the confused sea, the sails were torn from the gaskets, the ballast shifted, and the vessel thrown on to her beam-ends, the sea washing over her and sweeping off everything on deck. As no mention is made of any prolonged interval of calm during the cyclone, the great fall of the barometer indicates that the vessel was from 15 to 20 miles distant from the central area of calm, which, judging from the changes of wind direction, must have been to the east of the ship. From the assigned positions of the vessel at noon of the 30th and on the 1st the vortex of the storm was very approximately in latitude $18^{\circ} 45' \text{ N.}$ and longitude $89^{\circ} 25' \text{ E.}$ at 1 p.m. of the 31st. This would give an average rate of advance of nearly 12 miles during the preceding six hours, so that the velocity of the vortex was increasing as it advanced northwards.

The "Annie Fleming," "Forfarshire," and "Lightning" were near the vortex at 4 p.m.

The "Annie Fleming" was in the neighbourhood of the Eastern Channel lightship on the 29th, but as she could obtain no pilot, the captain put the ship's head to the south on the 30th to obtain sea room during the gale which was evidently approaching. At midnight there was every appearance of a severe storm. The barometer fell rapidly, the corrected reading at 8 p.m. of the 30th being 29.151 and at 4 a.m. of the 31st 28.754. The wind was now of hurricane force and accompanied with dense heavy rain. Her barometer fell to 28.455 at 2 p.m., and remained at this height until 4 p.m., during which interval the violence of the storm, ushered in at 2 p.m. by a terrific burst of wind, had carried away the sails and thrown the ship on her beam-ends. The position of the ship on the 1st was $18^{\circ} 59' \text{ N.}$ and longitude $88^{\circ} 24' \text{ E.}$ She probably had drifted some distance south and east during the passage of the cyclone. She was nearest the centre about 3 p.m., and the position, $19^{\circ} 10'$ or $19^{\circ} 15' \text{ N.}$ and longitude $89^{\circ} 30' \text{ E.}$ for the centre at that time obtained from these considerations, agrees closely with its subsequent position at 4 p.m. as obtained from the log of the "Forfarshire."

The "Forfarshire," which was passing up the middle of Bay, was in latitude $20^{\circ} 19' \text{ N.}$ and longitude $88^{\circ} 55' \text{ E.}$ at noon of the 30th, the wind being from east to south-east. She was then approaching the Eastern Channel lightship. She experienced heavy squalls and a strong gale during the day. The wind continued to increase during the night

and the morning of the 31st. At 11:30 a.m. it was blowing with great fury. The ship before this had stood to the southward under shortened sails, but at 11:30 a.m. lay to under bare poles. The ship's position at noon was latitude $19^{\circ} 30' N.$ and longitude $88^{\circ} 30' E.$ The barometer was lowest between 4 and 5 p.m., reading at that time 28.40, or, reduced for temperature and corrected to the Calcutta standard, 29.436". The vessel, which had probably drifted to the southward during the previous four hours, was then within 45 miles from the vortex, the position of which at 4 p.m. was thus approximately $19^{\circ} 20'$ and longitude $89^{\circ} 25'$, giving a velocity of 13 miles during the interval from the time when its centre passed to the east of the "Tennyson" to 4 p.m.

The "Lightning" arrived at the head of the Bay on the morning of the 30th. As the weather looked unsettled, she stood out to the south-east. The gale increased during the day. Her barometer, which at noon of the 30th stood at 29.90, fell until 3:30 p.m. of the 31st, when it read 28.90. The storm was at its worst between mid-day of Tuesday and 6 p.m., during which time the starboard and port life boats were cut away, and the mainsail, mizzen-topgallant sail, and lower fore-topsail were blown away by the wind. The ship was in the westerly quadrant of the cyclone. Her position at noon of the 31st was in latitude $19^{\circ} 46' N.$ and longitude $88^{\circ} 31' E.$ Allowing for the southerly current, the probable position of the vessel at the worst of the cyclone (3:30 p.m.) was $19^{\circ} 25' N.$ latitude and $88^{\circ} 30' E.$ longitude. This would assign the position of the storm centre at this time as in latitude $19^{\circ} 20' N.$ and longitude $89^{\circ} 30' E.$, agreeing very nearly with that obtained from the logs of the "Annie Fleming" and "Forfarshire."

The "Octavia," "British Statesman," and the "Palmas" were very near to the path of the vortex about 6 p.m. of the 31st.

The "Octavia" was on the 29th sailing northwards to Calcutta, being at noon in latitude $19^{\circ} 33' N.$ and longitude $90^{\circ} 14' E.$ She experienced heavy rains and variable winds during the afternoon. A whirlwind and waterspout passed near the vessel at 3 p.m., due to the same causes as the larger cyclonic disturbance further south. The weather became rapidly worse on the 30th, and towards evening the vessel, which was now near the lightship, turned southwards to obtain a safe offing. The barometer stood at 29.8 at 2 a.m. of the 31st, and fell rapidly during the day, reaching its lowest at 6.30 p.m., when it read 28.15. The vessel had drifted to the south-east towards the storm centre, and was at this time probably not more than 20 miles to the west of the vortex. The wind blew with hurricane force from noon, carrying away the sails and masts. The barometers and other instruments were broken to pieces by a wave which swept over the ship and washed them overboard. The storm began to abate at 8 p.m., so that the vessel appears to have been nearest to the vortex from 6 p.m. to 7 p.m. The lowest reading of the barometer on board the "British Statesman" was 28.2", taken at 6 p.m. These two vessels were probably within a few miles from each other. There is nothing in the logs of either vessel from which their exact position at the height of the storm can be assigned. Judging from the position of the vessels before the storm and the current southwards, the "Octavia" was probably in latitude $19^{\circ} 45'$ or $20^{\circ} N.$ and longitude $89^{\circ} 40'$ at 6 p.m., when the storm vortex passed a few miles to the east. The position of the vortex on this supposition would therefore be at this time in latitude $19^{\circ} 45' N.$ and longitude $89^{\circ} 50'$ or $90^{\circ} E.$, giving a rate of advance of nearly 15 miles an hour during the preceding two hours in a north-north-east direction.

The "Palmas" on the evening of the 30th was in the neighbourhood of the Eastern Channel lightship. The threatening weather induced the captain to put off to the south and prepare for the approaching storm. At noon of the 31st the position of the vessel by account was latitude $19^{\circ} 50' N.$ and longitude $88^{\circ} 50' E.$ Her barometer had fallen from 29.80 at midnight to 28.70 at 12 a.m. of the 31st. It continued to fall, and was at its lowest at 6 p.m., when it read 28.20. The vessel at this time was probably in latitude $19^{\circ} 40' N.$ and longitude $89^{\circ} 10' E.$ and at a distance of 20 or 30 miles from the centre. This would give the position $19^{\circ} 40'$ and $89^{\circ} 40'$ for the centre at 6 p.m., agreeing very closely with the positions as determined from the logs of the "Annie Fleming" and "Forfarshire," allowing for its north-north-east advance during the interval.

The last vessel in order of time which was within a few miles from the storm centre in its passage up the Bay was the steamer "Moulmein," proceeding from Chittagong to Calcutta. She left the former port on the 30th, and had a light northerly wind with a southerly swell during that day. The stormy weather did not extend to this corner of the Bay until the morning of the 31st. The barometer at 3 a.m. read 29.70, and fell to 29.53 by midday. The wind was then steady from the north-east, but rapidly increasing in intensity. The ship was at this time in latitude $21^{\circ} N.$ and longitude $90^{\circ} 17' E.$

The fore-topmast was carried away at 5 p.m. and the foremast at 7 p.m., at which time the spray was carried right over the ship. The lowest reading of the barometer was taken at 8 p.m., when it stood at 28.4". The centre of the cyclone was then passing to the east of the vessel between 8 and 9 p.m., and at a distance of from 40 to 50 miles. The "Moulmein" was at this time probably in latitude 20° 30' N. and longitude 89° 35' E., as her position at noon of the 1st, before she had resumed her voyage to Calcutta, was latitude 20° 20' N. and longitude 89° 10' E. The cyclone was therefore in latitude 20° 25' N. and longitude 90° or 90° 15' E. at 8.30 p.m., and was advancing now at a rate of nearly 18 miles per hour. The returns from the islands at the mouth of the Megna show that the centre passed over them between 3 a.m. and 4 a.m. of the 1st. They are in latitude 22° 35' N. and longitude 91° E. This gives during the last seven hours of its advance up the Bay an average velocity of nearly 22 miles. This is so very much greater than the velocity of advance of the majority of cyclones in the Bay, which very rarely exceeds 12 miles per hour, as to form one of the most important characteristics of the cyclone. Whether this unusually high velocity has any connexion with the other abnormal feature of the cyclone, the easterly element in its course, I am as yet unable to say.

The log of the French ship "Arabia" presents so many difficulties as to make it almost impossible to determine her varying position relative to the cyclone. Assuming that the log is recorded in nautical time, she was in latitude 11° 50' N. and longitude 89° 30' E. on the 28th, and therefore near the middle of the area of barometric depression, but to the east of the line of advance of the vortex on the 30th and 31st. Her log states that on the evening of the 27th she had incessant rain, a strong breeze, and a very high sea, and that from that time the weather became rapidly worse. On the 29th the weather was gloomy and threatening, and in the morning there was torrential rain. On the morning of the 30th the wind came in strong squalls, succeeding each other at short intervals. At midday she was in latitude 16° 6' N. and longitude 89° 27' E., and had a strong south-east wind, indicating that she was on the north-eastern quadrant of the advancing cyclone. On the evening of the 30th the wind blew in terrific squalls, and the waves swept over the vessel from stern to stem. At midday of the 31st the violence of the storm threw the ship on her beam-ends, and at 2.30 p.m. it was necessary to cut away the mainmast. Her barometer appears to have been lowest at 8 p.m. on the 31st, when the correct reading was 28.767. No latitude observation was taken on the 31st. Her position at noon of the 1st was 19° 15' N. latitude, and 89° 17' E. longitude. The only change of wind noted on the 31st is from south-east to north-west. This would seem to indicate that the vessel had passed round from the north-east to the south-west quadrant of the cyclone. From noon of the 30th to noon of the 1st, although only sailing north-east at the rate of a knot per hour, she had advanced from latitude 16° 6' N. to latitude 19° 15' N., notwithstanding that for some hours before noon of the 1st she must have drifted to the south under the action of the retreating mass of the storm-wave waters. The only supposition which will explain her assigned positions is that she drifted northwards with the advancing cyclone on the 30th and 31st, and was carried round by the force of the wind and current in front of the advancing cyclone from the north-eastern quadrant to the western and south-western quadrant during the afternoon of the 31st.

If this explanation, the only one I can suggest, be the true one, then the "Arabia" at 8 p.m. of the 31st, when her barometer indicated that she was nearest the centre, must have been in latitude 20° 30' N., and consequently have been carried a very considerable distance south during the next 8 or 10 hours, to account for her position at noon on the 1st.

The remaining logs are those of vessels which were in the upper part of the Bay during the cyclone, but at a considerable distance from the path of the vortex. They serve to confirm the accuracy of the assigned line of advance of the centre as determined from the logs of the vessels already discussed.

The S. S. "Busheer" was in the eastern quadrant at midday of the 31st, in latitude 17° 45' N. and longitude 92° 30' E., and at a distance of about 220 miles from the vortex. Her log is especially valuable, as it throws considerable light upon the character of the indraught on the outskirts of the southern and eastern quadrants. Early on the morning of the 31st she had terrific squalls from the south-east, with blinding rain at 7 a.m. They increased in violence and became of cyclonic intensity at 10 a.m. There was a lull of a few minutes at 0.30 p.m., followed by a return of the cyclone in full force from the east-south-east and south-east, with incessant terrific gusts, which continued to be accompanied by blinding rain.

The excessive rainfall on the south-eastern quadrant is confirmed by the logs of the "Empire of Peace," "Allahabad," and "Neva," all of which were in positions near latitude 20° and longitude 92° E. when the cyclone centre passed to the west of them about 10 p.m.

The "Empire of Peace" was in latitude $19^{\circ} 30'$ N. and longitude $91^{\circ} 20'$ E. at noon of the 31st. During the previous day the wind had blown a gale from the east-south-east, and was accompanied with heavy rain. The barometer fell to 29.18 at 6 p.m., and from that time to 10 p.m. she felt the full violence of the storm.

The "Allahabad" was in latitude $19^{\circ} 10'$ N. and longitude $90^{\circ} 48'$ E. by account at noon of the 31st or at midnight of the 30th; the time is not clearly stated, and appears from the log to be the latter. The corrected reading of her barometer at that time was 29.711". The lowest reading was 28.945 (corrected to the Calcutta standard) from 8 p.m. to 10 p.m. of the 31st. During the whole day there was constant rain. The exact positions of these ships are somewhat uncertain, as during the cyclone there was, as the captain of the "Allahabad" remarks, a strong current to the north-east on the eastern quadrant of the cyclone, whilst on the morning of the 1st, with the retreat of the waters of the storm-wave southwards, there was a very strong current in the opposite direction. The position of the ship at the worst of the storm was probably latitude 21° N. and longitude $91^{\circ} 30'$ E., which would agree closely with its position as determined from the fall of her barometer and the position of the storm centre as previously obtained.

The "Neva" was in latitude $19^{\circ} 21'$ N. and longitude $91^{\circ} 33'$ at noon of the 31st, and therefore within a few miles from the "Empire of Peace" and "Allahabad." Her captain notes that on the morning of the 31st the heavy squalls were accompanied with torrents of rain. The wind, which at 4 p.m. was blowing a hurricane, continued to increase in violence during the evening. At 11 p.m. he reports that the wind was then blowing a terrific hurricane with tremendous gusts, accompanied with torrents of rain, and spray blown from the tops of the waves, which were at this time very high. She was nearest the centre between 10 p.m. and midnight of the 31st. Her position at noon of the 1st, after she had drifted south under the action of the return current due to the storm-wave, was $20^{\circ} 33'$ N. latitude, and $91^{\circ} 7'$ E. longitude. She was probably in latitude $21^{\circ} 15'$ V. and longitude $91^{\circ} 20'$ E. at the worst of the storm.

The logs of the remaining vessels throw no additional light on the path of the vortex, and it is therefore unnecessary to discuss them *seriatim*. The following table gives the probable position of the vessels whose logs are recorded in Chapter I. when they were nearest to the storm vortex, their distance and bearing from it, with a brief summary of the damage caused by the storm.

Vessel.	For log see page	Latitude when nearest.	Longi- tude.	Lowest reading of barometer (uncorrected).	Distance from and bearing of centre.	Time when nearest.	REMARKS.
S.S. City of Venice	80	$14^{\circ} 40'$ N.	$85^{\circ} 15'$ E.	29.45	Miles. 210 E.	30th, 10 a.m.	Ship at 9.20 a.m. of 30th. Found gale so severe that she was turned round to south-west for several hours.
„ Japan	97	$12^{\circ} 10'$	$85^{\circ} 30'$	29.65	270 N.E.	30th, 12 „	Fresh gale with heavy squalls and showery weather. Engines at dead slow from 7.20 a.m. to 6.20 p.m.
„ Penang	108	$17^{\circ} 30'$	$86^{\circ} 50'$	29.32	150 E.	31st, 4 to 7.30 a.m.	Boats washed away; sails carried away; ship a perfect wreck on deck and obliged to return to Calcutta.
Bushire	118	$17^{\circ} 45'$	$92^{\circ} 30'$	29.52	220 N.W.	31st, 12 a.m.	Fore-topmast, main-topmast, and mizzen-topgallant mast carried away.
Scottish Chieftain	115	$18^{\circ} 50'$	$88^{\circ} 10'$	29.00	90 E.	31st, 12 „	
Tennyson	92	$18^{\circ} 40'$	$89^{\circ} 10'$	28.15	20 E.	31st, 1.30 p.m.	Sails blown away; ship a wreck on deck.
Foam	117	$19^{\circ} 0'$	$87^{\circ} 5'$	29.10	100 E.	31st, 2 „	Sails carried away; ballast shifted.
Annie Fleming	109	$18^{\circ} 55'$	$88^{\circ} 20'$	28.50	50 to 60	31st, 4 „	
Lighthouse	104	$19^{\circ} 25'$	$88^{\circ} 30'$	28.95	65	31st, 3.30 „	Port lifeboat and starboard lifeboat cut away; main sail, mizzen-topgallant sail carried away.
Thessalus	113	$19^{\circ} 40'$	$88^{\circ} 10'$	29.05	90 E.	31st, 4 „	Top-sails blown away; main-topgallant mast carried away.

Vessel.	For log see page	Latitude when nearest.	Longi- tude.	Lowest reading of barometer (uncorrected)	Distance from and bearing of centre.	Time when nearest.	REMARKS.
Forfarshire -	103	19° 20'	88° 30'	28.40	45 E.	31st, 4.30 "	Wind blew sails out of gas- kets; three topgallant masts carried away.
Coleroon -	113	19° 45'	87° 30'	29.25	125 E.	31st, 5 "	
Lady Octavia -	94	19° 45'	89° 40'	28.15	20 to 25 E.	31st, 6 "	Sails carried away or blown to pieces; fore-gallant mast, mizzen-topgallant mast, starboard lifeboat swept away; deck gear all washed away.
Palmas -	111	19° 45'	89° 10'	28.20	35 E.	31st, 6 "	Ballast shifted; masts cut away; starboard anchor let go; sails blown and torn out of gaskets.
Allahabad -	103	21°	91° 30'	28.90	80 N.N.W.	31st, 9 "	Sails torn from gaskets; canvas in mizzen rigging blown away.
Clarence -	110	20° 30'	88° 10'	29.10	100 E.	31st, 6 "	
British Sceptre -	94	19° 50'	91° 25'	29.22	110 N.N.W.	31st, 6 to 8 "	Foresail and main-topsail split.
Planet -	120	—	—	28.80	60 E.	1st, 2 a.m.	
British Statesman -	110	20° 10'	89° 30'	28.20	20 E.	31st, 8 "	Sails blown away; topgal- lant mast, topmast, fore and main mast carried and cut away.
Arabia -	89	20° 30'	—	28.77	60	31st, 8 p.m.	Mainmast cut away; sails carried away by the wind.
Moulmein -	116	20° 30'	89° 35'	28.40	45 S.S.E.	31st, 8 to 9 "	Foremast, main-topmast, and funnel carried away.
Empire of Peace -	88	20° 20'	91° 30'	29.18	95 N.N.W.	31st, 9 "	Lower main-topsail split, fore-topgallant mast cut away, main and mizzen topgallant blown away, and rudder-head gave way.
Neva -	119	21° 15'	91° 20'	29.05	85 W.N.W.	31st, 11 "	Lower mizzen-topsail, up- per and lower fore-top- sail, foresail, cross-jack, mizzen-topgallant sail, and main and mizzen topgal- lant staysails all blown away.

The following are the barometric readings taken on board of the vessels, the barometers of which were compared with the Calcutta standard after their arrival in the Port of Calcutta:—

Ship's name.	Date and hour.	Barometer.		Barometer reduced and corrected.	Wind direction.	Ship's position.	
		Observed.	Attached Thermometer.			Latitude.	Longitude.
Forfarshire	October.						
	25th, 12h.	29.850	—	29.879	—	11° 30' N.	90° 30' E.
	28th, 12h.	.800	—	29.829	N.E. to E. & S.E.	18° 30'	88° 23'
	29th	—	—	—	Easterly.		
	30th, 12h.	29.750	—	29.779	E. to S.E.	20° 19'	88° 55'
	30th, 24h.	.600	—	.631	N.E. by E.		
	31st	—	—	—	N.E.		
	31st, 12h.	29.200	—	29.232	—	19° 30'	88° 30'
	31st, between 4 and 5 p.m.	28.400	—	28.436	Cyclone raging with its utmost fury.		
	31st, about 5 p.m.	—	—	—	N. & N.N.W.		
Scottish Chieftain.	November.						
	31st	29.800	—	29.829	From W. to S.W.		
	October.						
	29th	—	—	—	N.E.		
	29th, 7.30 p.m.	—	—	—	E.N.E. to S.E.		
	30th	29.800	—	29.758	N.E.		
	30th, 4 p.m.	—	—	—	N.E.		
	30th, 8 " to mid- night.	.620	—	29.578			
	31st, 3 a.m.	.200	—	.161			
	31st, 10 "	.100	—	.062	N.		
	31st, noon	.000	—	28.962			
	31st, 4 p.m.	.100	—	29.062	N.N.W.		

Ship's name.	Date and hour.	Barometer.		Barometer reduced and corrected.	Wind direction.	Ship's position.	
		Observed.	Attached Thermometer.			Latitude.	Longitude.
Thessalus	October						
	30th, 8 a.m.	30.000	80	29.852	E.	20° 28'	90° 55'
	30th 10 "	.026	—	.878			
	30th, noon	29.962	81.1	.811	E. by N.		
	30th, 4 p.m.	.886	82	.734	N.E.		
	30th, 8 "	.908	81	.758	N.E.		
	30th, midnight	.826	80.2	.679	N.E.		
	31st, 4 a.m.	.740	80.2	.593	N.E.		
	31st, 8 "	.600	79.1	.457	N.E. by N.		
	31st, noon	.400	—	.255	N.E. by N.		
	31st, 4 p.m.	.050	—	28.907	N. by E.		
	31st, 8 "	.420	—	29.274	N. or N.N.W.		
	31st, midnight	.700	—	.554	N.W. or W.N.W.		
	November.						
	1st, 4 a.m.	.810	—	.663	—	19° 52'	87° 54'
	1st, 8 "	.930	—	.782	—		
Foam	October.						
	30th, 1h.	29.96	83	29.735	Calm.		
	30th, 2h.	.94	83	.715	Light airs from N.E.		
	30th, 3h.	.94	84	.715			
	30th, 4h.	.94	84	.712			
	30th, 6h.	.92	84	.692	N.N.E.		
	30th, 8h.	30.00	85	.771	N.E.		
	30th, 10h.	29.96	85	.730	N.E.		
	30th, 12h.	.98	86	.746	N.E.		
	30th, 14h.	.94	84	.715			
	30th, 16h.	.79	82	.568			
	30th, 18h.	.78	82	.558			
	30th, 20h.	.79	82	.568			
	30th, 22h.	.80	82	.578			
	30th, 24h.	.82	82	.598			
	31st, 2h.	29.67	—	29.449	N.E.N.N.E. at 9h.		
	31st, 11.30h.	.24	—	.021	N.		
	31st, 12h.	.20	—	28.982	N.		
	31st, 14h.	.10	—	.882	N.N.W.		
	31st, 15.37h.	.2	—	.982	N.W.		
	31st, 16h.	.5	—	29.279	N.W.		
	31st, 17h.	.27	—	.052	W.N.W.		
	31st, 18h.	.33	—	.112	W.N.W.		
	31st, 19h.	.45	—	.232	W.		
	31st, 20h.	.50	—	.282	W.		
	31st, 22h.	.62	—	.402	W.		
	31st, 24h.	.70	—	.482	W.		
	November.						
	1st, 2h.	.72	81	.501			
	1st, 4h.	.73	81	.511	W.		
	1st, 6h.	.80	85	.570	W.		
	1st, 8h.	.86	86	.627	W.N.W.		
	1st, 10h.	.90	82	.678			
	1st, 12h.	.89	83	.665	N.W. by N.		
Foam	November.						
	1st, 14h.	29.86	84	29.633	W.N.W.		
	1st, 16h.	.84	84	.613			
	1st, 18h.	.85	84	.625			
	1st, 20h.	.87	83	.645	N.W. by N.		
	1st, 22h.	.90	83	.675			
Arabia	October.						
	28th, noon	29.725	—	29.512	—	11° 50'	89° 01'
	29th	.764	—	.551	—	14° 19'	89° 30'
	30th	.646	—	.433	—	16° 06'	89° 27'
	31st	.410	—	.198	—	19° 13'	89° 17'
	31st, 4 p.m.	.134	—	28.924	—		
	31st, 8 "	28.977	—	.767	—		
	1st, 1 a.m.	29.134	—	.924	—		
Allahabad	1st, 5 "	.449	—	29.237	—		
	October.						
	28th	.70	79	29.744	S.S.E. to S.	12° 4' N.	91° 0' E.
	29th	.70	81	.738	S.E.	14° 53'	92° 10'
	30th	.70	80	.741	S. to E.	17° 57'	91° 40'
	30th, midnight (?)	.67	80	.711	—	19° 10'	
	31st, noon	.45	—	.492	—		
	31st, 2 p.m.	.30	—	.342	—		
	31st, 4 "	.20	—	.243	—		
	31st, 6 "	.10	—	.144	—		
	31st, 8 "	28.90	—	28.945	S.E.		
	31st, 10 "	.90	—	.945	S.S.E. to S.		
	31st, midnight	29.20	—	29.243	S.S.W.	20° 13'	91° 40'
	November.						
	1st, a.m.	—	—	—	W.S.W.		
	1st, noon	.80	—	.840	—		

Ship's name.	Date and hour.	Barometer.		Barometer reduced and corrected.	Wind direction.	Ship's position.	
		Observed.	Attached Thermometer.			Latitude.	Longitude.
Clarence	October.	Aner.	Bar.	Aner.	Bar.		
	30th, noon	—	—	—	—	N.E.	
	31st, midnight	—	—	—	—	N.E.	
	31st, 4 a.m.	—	—	—	—	N.E. by N.	
	31st, noon	29.35	29.40	81	29.362 29.324	N.N.E.	
	November.						
	1st	—	.15	—	.078	N.	
	1st, 6 p.m.	—	.10	—	.029	N.N.W.	
	1st, midnight	—	.30	—	.227		
	1st, noon	—	.80	81	.725	W.	20° 2' 88° 20'
Annie Fleming.	October.						
	30th	—	29.60	—	—		
	30th	—	.50	—	29.450	E.N.E.	
	30th, 4 p.m.	—	—	—	—	E. by S. to E.N.E.	
	30th, 8 "	—	29.20	—	.151		
	31st, 4 a.m.	—	28.80	—	28.754		
	31st, 7 "	—	.60	—	.555		
	31st, 2 p.m.	—	.50	—	.455		
	31st, 4 "	—	.50	—	.455	N.	
	November.						
	1st	—	—	—	—	18° 59'	88° 24'
	2nd	—	—	—	—	19° 5'	88° 25'

The following points, which are of importance in the meteorological discussion of the question, seem to me to be fully established by the discussion in this and the preceding chapters—

- (1.) That for some days after the 20th there was fine unclouded weather over the whole of the Bay, with moderate winds and very slight differences of pressure.
- (2.) That the stormy weather and rain squalls commenced in the south of the Bay and gradually extended northwards and became more violent, at first gradually, but afterwards with increasing rapidity, and that this was accompanied by a diminution of atmospheric pressure, similar in character—that is, the diminution at first proceeded slowly, and afterwards more and more rapidly with the persistence of the causes.
- (3.) That nowhere round the limits of the Bay were the winds during the whole of this period of such a character as to indicate an excessive indraught from any region external to the area of diminishing pressure and stormy weather. The slight increase of velocity which occurred round the south-western limits, more especially in Ceylon, was such as can be most easily explained by the supposition of an increasing internal action in the Bay followed by convergence of the winds from the outer limits. The Nancowry returns and the logs of the vessels, moreover, appear to show conclusively that the wind motion was from the first strongest near the centre and gradually decreased in violence towards the limits of the Bay.
- (4.) That the cyclone proper was preceded by a more general cyclonic movement around the Bay, due to meteorological conditions and action beyond the Bay.
- (5.) That the development of the cyclone proper was, however, due to causes and action confined almost entirely to the Bay, originating and intensifying there without exercising any marked effect on the meteorology of the coast districts until it was fully formed and proceeding towards the head of the Bay. Hence the immediate causes of the cyclone formation and action must be sought for in the meteorology of the Bay itself during this period.
- (6.) That the cyclone atmospheric action and motion was probably confined almost entirely to the lower strata of the atmosphere. During this cyclone period, from the 3rd to the 31st, the wind velocities of the two elevated stations in Ceylon—Kandy and Newara Eyla—were remarkably small, indicating almost perfect atmospheric equilibrium and calm in the higher strata. This supposition is, however, chiefly established by the fact that the Tipperah Hills formed an effective barrier to the cyclone, not merely disintegrating and breaking up the cyclone vortex in the lowest atmospheric strata, but completely dissolving and terminating the general atmospheric disturbance, of which the cyclone proper was the most marked feature.

CHAPTER IV.—PROGRESS OF THE CYCLONE OVER EASTERN BENGAL.

THE account of the advance of the cyclone after it reached the mouth of the Megna is very brief, as its further progress inland was prevented by the Tipperah Hills, which speedily broke it up. The materials for investigating its path are very meagre, as the districts to the north-east of Noakholly are thinly populated. I shall first of all trace the path from the information supplied by the various district officers who have assisted me, as far as was possible under the peculiar circumstances, to obtain accurate information. This will be followed by a table giving a summary of the changes of wind direction in the area more or less affected by the storm, and by a series of observations taken during the storm at the Government observatories at Chittagong, Saugor Island, and Calcutta, and on board the steamer "Prince Albert," lying near Goalundo.

The following table, drawn up by Baboo Sreenath Ghose, Manager under the Court of Wards, gives in a brief form the most important facts respecting the cyclone when it struck the coast at the mouth of the Megna :—

—	Height of inundation in feet.	Duration and time of wind from north and north-east.	Duration and time of wind from east.	Duration and time of lull.	Duration and time of wind from west.	Time and duration of inundation, and time of subsidence.	Time of end of storm.	REMARKS.
South Bamni	9 to 17 -	9 to 11 p.m. 31st October from north-east.	11 p.m. 31st October to 2 a.m. 1st November from east, east inclined to south. At 1 a.m. there were three or four rushes direct from south.	4.30 to 5 a.m. 1st November.	5 to 9 a.m. 1st November.	Water first came from south at 2 a.m. 1st November; then from west at 5 a.m.; from 6 a.m. began to subside.	9 a.m. 1st November	The velocity of the wind from the east was greater than that of the wind from the north-east. The force of the wind from the west appeared to be about the same as that from the east.
Siddhi	8 to 13 -	9 p.m. 31st October to 2 a.m. 1st November north-east.	2 to 3.30 a.m. 1st November from east.	3.30 to 4 a.m. 1st November.	4 to 9 a.m. 1st November.	Water first came from north-east at 2 a.m. 1st November, then from west at 4 a.m. after half-an-hour began to subside.	Ditto -	Time of flood-tide was 11 p.m. 31st October. Time of ebb-tide was 4 a.m. 1st November.
Sundeeep	7 to 13 -	11 p.m. 31st October to 2 a.m. 1st November from north-north-east.	2 to 2.30 a.m. 1st November from east, and then from 2.30 to 3.30 a.m. south-east.	Ditto -	Ditto -	Water first came from south-east at 2.30 a.m. 1st November then from west at 4 a.m.	Ditto -	In churs north of Hattiya and Sundip the water first came from the north-east: it was salt water.
Nulchira Hattiya Nilakhyi	9 to 28 7 to 38 9 to 28	8 to 11 p.m. 31st October from north to east.	11 p.m. 31st October to 1 a.m. 1st November from east, then up to 3 a.m. from south-east.	3 to 3.30 a.m. 1st November	3.30 to 9 a.m. 1st November	Water first came from south-east at 2 a.m., then from west at 3.30 a.m.	Ditto.	
Sudharam	8½ feet on the very elevated parts, and 8 ft. on the general level land low in the town, and 10 ft. one mile south.	9 p.m. 31st October to 2 a.m. 1st November from north-east.	2 to 4 a.m. 1st November from east, and east inclined to south. At 3.30 there were three or four gusts from the south direct.	4 to 4.30 a.m. 1st November	4.30 to 6.30 a.m. from west, and then from north-west afterwards from north.	Water first came from south at 5.30 a.m., and then from west at 6.30 a.m.; began to subside from 7 a.m.	Ditto.	

The vortex passed over the islands of Nulchira and Hattiya between 3 and 3.30 a.m., over Siddhi between 3.30 and 4 a.m., over Noakholly, according to the most reliable accounts, from 4 to 4.30 a.m., and, as will be presently stated, over Dewangunge about 5 a.m. This would give a rate of advance of from 20 to 25 miles per hour, and confirms the unusually high velocity which has been already derived from the positions of the vessels in and near its path over the upper portion of the Bay.

The following are abstracts of the reports of the meteorology of the districts at the mouth of the Megna, obtained and forwarded by Mr. Porch, Collector of the Noakholly district, and give the whole of the information which could be gathered from the native officials and population of the changes of wind direction over the area including the path of the cyclone vortex :

"*Nulchira.*—The wind during the day was from the north and north-east, increasing during the night. It afterwards changed to south-west and west, and blew very hard. The wind fell rapidly during the morning of the 1st."

"*North Hattiya.*—The day of the 31st was cloudy, the wind blowing from the north-east. At noon there was a shower which lasted half-an-hour. At 3 p.m. it began to rain again, and continued until 8 a.m. of the following day. It was, however, not heavy, except before the commencement of the storm, which began about 8 p.m., the wind then blowing from the north and gradually increasing in intensity. It became very violent at 11 p.m., and then shifted to the east, still increasing in violence, and blew down trees and houses."

"*Sundeeep.*—During the afternoon of the 31st the wind was from the north, and gradually increased in velocity. At 11 p.m. it shifted to north-east, and at 11.30 p.m. to east. The wind was at that time so violent that trees were uprooted and houses blown down. At 12 p.m. it veered to south-east and was still increasing in intensity and accompanied with rain. At 1 p.m. it veered through south to south-west, and

continued to blow in that direction during the remainder of the night. The result of later inquiries is that no period of calm such as that described in the report of Baboo Sreenath Ghose occurred in the island of Sundeeep during the cyclone."

"*Siddhi*.—The sky was cloudy on the 31st, rain falling during the afternoon. The wind was then from the north and north-east, and blew hard from 11 p.m. It afterwards changed to east, still increasing in violence, and blew down houses and trees. At about 3 a.m. there was a short calm, after which the wind went round rapidly from south through south-west to west, from which direction it blew hard. There was rain during the night, but no thunder or lightning."

"*South Bamni*.—The wind previous to 3 a.m. of the 1st had shifted from north through north-east to east. Shortly after 3 a.m. it changed to the west."

"*Noakholly*.—The information of the state of the weather for this station is much more complete. The following is Mr. Porch's interesting account of the storm at this station."

"The storm at Noakholly appeared at about 11 p.m. as a cyclone, the north being its general direction, with a bearing to the east. It showed a tendency also to go southwards by the east, but blew only a very short time from the south-east at about 11.30 or 12 p.m. in the extreme south of the district. It attained its greatest force from the east at about 1 a.m., and maintained the same force when it veered back to the north-east at 1.15 a.m. This was the first part of the storm, during which the wind blew chiefly from the north-east; and towards its close, at about 3.30 a.m. the wind was described as variable and unsteady, and shifting about with violent gusts, east and west and east, from a northerly direction. People say at Noakholly strong gusts at about 3 a.m. came from the north-east, then north-west and west, and then a few strong gusts from the south-west and south, and again from north-east, which last direction the storm generally maintained, when the wind rather quickly fell at about 3.30 a.m. Then there was a lull from 4 a.m. to 4.30 a.m., towards the close of which the inundation was heard coming in along with the wind from the west; the wind, again increasing from the west, blew hard. This was the second part of the storm as experienced by people at the Noakholly station. In that interval of calm, the moon being bright, people left their broken-down houses and homesteads to look after their neighbours and to see the injury done to one-another's houses, and to learn how they had fared in the storm. Then began to be heard what the natives describe as horrible sounds, viz., distant roaring from the wind and inundation in the south, which afterwards appeared at Noakholly between 5.15 and 5.30 a.m., and which they could then hear, while there was perfect calm and stillness, amid the desolation at the station of Noakholly."

"The greater part of the trees lie from north to south with much westerly direction, and a great many lie due west, and some very slightly inclined to the north-west. Some houses and some trees were found lying to the east. It seemed to me that night that the wind from the west at about 4.30 a.m. was quite as swift and strong as the wind from the north-east before it reached the climax at 1 a.m. It was very strong, and it may, as some others assert, have been as strong at this place from the west in the second part of the storm as it was at any time from the east and north-east in the first part; but it was of short duration in intensity from west compared with its duration from the north and north-east and east in the first part of the storm. The second appearance of the cyclone, with its counter-blast from the west, has not left such marked signs of its direction in fallen trees and houses, &c. as the protracted and intense blowing of the first part of the cyclone from the north-east has left everywhere. The force of the cyclone was greatest from the east and north-east at 1 a.m., and after as described till the storm began to oscillate and was followed by a lull at about 4 a.m. The European residents and almost all the people in the station were up all night and were observing what was going on. The Civil Medical Officer's report (given below) appears to be very correct as regards Noakholly (Sudharam)."

"The cyclone appeared and prevailed first north and north-east, generally showing much variableness from 3.30 to 4 a.m., just before the lull. After this it reappeared in an almost opposite quarter and considerably south apparently of its first area. It seemed to travel up, as it were, from the Bay to north, blowing across the islands obliquely from the west inclined to south-west towards the east, and this direction of the wind with the direction of the tide caused the great inundation from south-west to north-east. The Daula water inundation from the west after the lull was therefore experienced first in the islands on the extreme south, and then gradually in the north of the islands and over the mainland during the next two hours, as the westerly wind travelled northwards. The lull, too, appears to have been earlier and of much shorter duration in the islands to the south."

“The Sundeeep and Hattya people say that for two or three days before the cyclone they constantly heard a roaring sound to the south in the Bay, and they knew that it was a traditional warning of a storm and flood, but in their easy-going heedlessness they almost all took no precautions. A very few people, however, in both islands, thus forewarned, are said to have prepared plantain-rafts and tied them with long ropes to the trees in their home plantations, and thus saved themselves and their families. The inhabitants of these parts know their danger in the months of Jyest and Kartick, and should always have such simple life-buoys of plantain trees or plaintain and bamboo and rope ready fixed adjoining their houses within their tree-surrounded compounds. Many people in the islands and on the mainland say they saw lights passing apparently from west to east at the beginning of the cyclone. The Amergong people saw lights keep on appearing at several points on the horizon in the east. In thanas Sudharam and Begumgunge hailstones fell at the beginning of the cyclone. At Begumgunge a light was seen in the east like a comet, the people say.”

The following account sent by Mr. Lyons, Civil Medical Officer, gives the observed changes of wind direction and the chief features of the storm at Noakholly :—

“4 to 5 p.m.—Heavy shower; wind N.N.E.

“7 to 8 p.m.—Drizzling rain; wind N.N.E., cold and sharp.

“9 p.m.—Drizzling rain; wind freshening, N.N.E.

“10 p.m.—Rain heavier; wind last half-hour blowing strong from N.N.E.

“11 p.m.—Heavy rain; wind blowing a hurricane from N.N.E.

“12 p.m.—Heavy rain, but it looks like mist as it is borne along the wind; wind blowing a hurricane from N.N.E.

“1 a.m.—Heavy rain, but it looks like mist as it is borne along the wind; wind, if anything, higher, and a few minutes past this hour it suddenly changed to east for about a quarter of an hour, returning as suddenly to N.N.E., when I noticed the falling of a tree some 50 yards north of the circuit-house. The storm evidently was now at its height, as tree after tree came down, and the window-shutters on the north face of the circuit-house were torn away.

“2 a.m.—Still raining heavily; wind blowing furiously from N.N.E.

“3 a.m.—Rain abating; wind still high from N.N.E., but not blowing so furiously.

“3.30 a.m.—Rain ceased and there is a perfect lull. What little wind there is is from the west, and borne on it is a distant southing sound, which gradually, as the wind again rising high at 4 a.m., deepens with a “booming,” now recognised as the sound of rushing water, which about 5 a.m. reached the station. Shortly after this hour the wind died away to a cold sharp breeze, the flood advancing meanwhile and reaching its maximum height some ($3\frac{1}{2}$ feet in the more elevated parts of the station) about 7 a.m.

“The rainfall registered in the jail was 5.12 inches.”

NOTE by R. PORCH, Esq., Officiating Magistrate, Noakholly.

“Noakholly.—The wind blew with great force from N.N.E. from 11 p.m., and blew with its full force when it veered to the east at about 1 a.m. Then the destruction went on, and after, when it veered back to N.E., maintaining its highest force and velocity, and continued blowing furiously.

“Between 4.30 a.m. and 5 a.m. it blew as hard from the west, and sometimes slightly south-west, as it had done from N.E. between 11 and about 1 a.m. before the climax was reached by the change to east at about that time, viz., 1 a.m.

“Islands.—Between 3 a.m. and 4 a.m. the wind blew hard from the south-west, and very hard from the west, in the islands below the Megna.”

The centre of the storm passed over Nulchira and South Hattiya between 3 and 3.30 a.m., and was then advancing in a north-easterly direction. It passed over the island of Siddhi half-an-hour later. Noakholly is due north of the island of Hattiya, and it is almost impossible that the same vortex should have passed from Hattiya eastwards to Sundeeep and Siddhi, and should still later have visited Noakholly. To reconcile these facts it would have been necessary to have assumed that the vortex was elliptically shaped, its greatest diameter measuring at least 30 miles and lying at right angles to the line of motion, and that it moved first eastwards from Hattiya to Sundeeep and then northwards over Noakholly. I was assured by Mr. Porch that the facts and times given in the table compiled by Baboo Sreenath Ghose were very approximately correct, and were obtained after careful and lengthened investigation. However, he made further enquiry, and the result is, to quote his words,—“It appears conclusive that there was no lull in Sundeeep proper. The lull was experienced in Siddhi, the northernmost of the three well-defined islands, like tracts, forming the island of Sundeeep. In South Bamni there was a lull of about the same duration as at Sudharam (Noak-

holly); at Dewangunge and Silonea the duration of the lull was much shorter than at Noakholly and later in point of time. At Lakhyipur, as well as Raepur and Ramgunge, to the north of Lakhyipur, there was no lull during the cyclone, which prevailed all night from about 10 p.m. till after daybreak. There were brief intervals of comparative calm, after which the rushes and gusts of wind were intensely violent. The direction of the wind at Raepur and Rumgunge was from N.N.E. and N.W.; at no time did it blow from due east or west or from a southerly direction."

The vortex, it is clear, passed over the islands of Manpoora, Nulchira, Hattiya, and Siddhi, and over the district including the stations of Noakholly, Bamni, Amergaon Silonea, and Dewangunge. If it was the same vortex which passed over this area, this would give it a breadth from N.N.W. to S.S.E. of at least 16 miles; while the duration of the calm, combined with the rate of progression of the storm, assign it a length in the direction, of motion of from 8 to 10 miles. This would prove it to have been elliptically shaped, the greatest axis being probably nearly at right angles to the direction of motion.

It is by no means conclusive from the evidence that there was only one well-defined vortex at this period. It seems to me probable that the first vortex either was spent out over the islands, and that a second vortex was formed near Noakholly, or that the vortex was already beginning to break up, giving rise to small eddies in advance.

These suppositions receive little confirmation from Dr. Lyons' observations, but the following remarks of Mr. Porch seem to favour one of these inferences. In his report he says,—“Towards the close of the first part of the storm, at about 3.30 a.m., the “wind was described as variable and unsteady, and shifting about with violent gusts east “and west, and east from a northern direction (*i.e.* through north). People say at Noak- “holly strong gusts came from the north-east, then north-west and west, and then a few “strong gusts from the south-west and west, and again from north-east, which last “direction the storm generally maintained, when the wind rather quickly fell at 3.30 a.m. “Then there was a lull from 4 a.m. to 4.30 a.m., after which the wind, again increasing, “blew hard from the west.” Mr. Porch's facts attesting the variableness of the wind are confirmed by the report of Annoda Kishore Roy, Court Inspector at Noakholly:—

“31st October, evening.—Wind due north.

“10 to 11.30. p.m.—North with violence.

“12 to 2 a.m. and 2 to 3 a.m.—Wind north-east and east, at the end of which time there were gusts from west and north-west, veering towards south-west at the close. The wind was, however, generally in the north-east.

“3.30 to 4 a.m.—Lull.

“4 to 5.30 a.m.—Wind westerly.

“8.30 in the morning.—Wind north and north-east.

“The length of the lull was about half-an-hour. It was general throughout the district.”

The Court Inspector states clearly that at 3 a.m. there were gusts of wind from west and north-west, and that it veered towards the south-west, but that the wind was generally in the north-east before the lull from 3.30 to 4 a.m.

Probable instances of the formation of a new vortex in advance are given in the report on the Calcutta cyclone of 1864.

A strange fact, brought to my notice by Mr. Porch as having given rise to much superstitious feeling amongst the natives, is that the great mandar-tree on chur Sekundur, on the coast to the south of Noakholly, a well-known land mark, has escaped injury, without, as the natives say, the loss of a branch or leaf to mark the completeness of its escape amidst the surrounding desolation.

Amergaon.—The wind blew from north during the 31st, increasing in velocity as evening set in. Rain began to fall about 2 p.m. At nightfall the wind still continued to increase, and at 11 p.m. changed its direction from north to north-east, and then veered to east and south-east about midnight. There was a short calm at about 3 a.m., when the wind veered to the west. There was a calm every time the wind changed its direction, but these calms were hardly perceptible, whilst the calm, which lasted about half-an-hour, when the wind changed from south-east to due west, was altogether different.

“Amergaon is north-east from Noakholly, at a distance of 18 miles. The eastern edge of the vortex passed over it, as indicated by the calm and change of wind. The time (3 a.m.) is evidently wrong, depending only upon the information of the villagers.

“*Dewangunge.*—The sky was cloudy and gloomy during the whole day. At 3 p.m. rain began to fall in slight showers; it fell more heavily as night approached. The wind increased during the evening, and was blowing very strongly from the north-east at 11 p.m. It then shifted through east to south, blowing with redoubled force, and overturning whatever opposed it. It afterwards went round rapidly to west,

gradually abating, though rain continued to fall until 11 a.m. of the 1st. 'Another informant states that the storm ceased for a short time at 5 a.m., the calm lasting about 10 or 12 minutes. The sky at the time appeared red in the west.'

"*Silonea*.—There was a calm of about five minutes at 5 a.m., the only interval of prolonged calm which was observed at this station.

"*Lakhipoor*, 19 miles to west-north-west of *Noakholly*.—The weather was cloudy on the evening of the 31st, the wind being from the north-east. It was not so dark as is usually the case before the occurrence of a storm. It began to blow heavily at midnight from the north, then from the east, and afterwards from the west. There was no thunder or lightning, only horrible sounds were heard. The wind continued until 8 a.m. of the 1st. During its continuance there were occasional lulls lasting for two or three minutes.

"*Miserai*.—An easterly wind began to blow strongly at 9 p.m., and was attended with drizzling rain. It afterwards shifted to south-east, growing more violent until 3 a.m. From 4 a.m. to 7 a.m. it blew from the south-west with equal violence."

The reports from the remaining stations and villages near the storm centre from which I have received information are very meagre and unsatisfactory, judged from a meteorological standpoint.

Little more remains to be told of the path of the vortex of the Backergunge cyclone. After passing north-east over *Noakholly* at 4 a.m., and over *Dewangunge* and *Silonea* at 5 a.m., where the interval of calm was comparatively short, it was advancing towards the angle formed by the *Tipperah Hills* and the *Arrakan Hills*. The whole of the district is thinly populated. It is a tract gradually rising up from the flat land along the banks of the *Megna*. The *Tipperah Hills* are not very high, but they consist of a series of parallel ridges running north and south, increasing in height eastwards. The outlying spurs near the sea are not more than three or four hundred feet high, but the more central portions attain at their highest points an elevation of from two to four thousand feet. The cyclone disturbance occupied an area of at least 400 miles in diameter at sea. When the centre was passing over *Noakholly* the northern limits had been involved for some time amongst the *Tipperah Hills*. The disturbing action of these ridges, which were at right angles to the direction of motion of the wind in the northern quadrant of the cyclone, was rapidly shown. The large regular converging motion towards the centre was prevented on the north-eastern side, and a number of small eddies probably formed. The result was that the vortex broke up at some distance south of the *Tipperah Hills*, two or three hours after it passed over the north-east angle of the Bay.

"*Comillah*.—The Civil Surgeon of *Comillah*, a station 40 miles due north from *Noakholly*, writes that the wind for several days previous to the 31st had been steady from the north. The barometer fell on the 31st, whilst the wind changed to north-east. No readings of the barometer were taken, as the building containing it was unroofed during the storm. The anemometer was also blown away during the evening. The wind during the afternoon and evening blew strongly from the north, with occasional gusts, and shifted a little towards the east from 9 p.m. until 11.30 p.m., when the storm increased to a hurricane, the wind coming from the north-east, with occasional lulls. It continued to blow a strong gale from the same quarter until 5 a.m. of the 1st, when it gradually moderated, and was fine weather at 7.30 a.m."

The steadiness of the wind direction at *Comillah* and the cessation of the storm three hours after its centre passed over *Noakholly* are important. The wind direction indicates that the station was on the north-western quadrant of the cyclone when its vortex was passing over the mouth of the *Megna*. There was thus at *Comillah* a steady north-east wind, very violent from 11.30 p.m. to 4 a.m., during which the distance of the vortex had decreased from 130 to 45 miles. During the next two hours the centre did not advance so far north as to affect the wind direction. The only possible inference is that the vortex which passed over *Noakholly* advanced a very short distance to the north-east, and was broken up at least 20 or 30 miles south-east of *Comillah*. The *Backergunge* cyclone was on a much larger scale than the *Vizagapatam* cyclone. Its central area of calm was much larger, and the diameter of the air moving with hurricane force was probably five or six times as great. Its rate of progression was more than double of that of the *Vizagapatam* cyclone. Both advanced almost directly to the opposing mountain masses, and yet from slight differences in the character of the mountain obstructions, the smaller and slower moving cyclone merely suffered deflection and slow disintegration, whilst the larger and more rapid cyclone was not only completely broken up in the space of a few hours, but its extinction was very speedily followed by the disappearance of the atmospheric disturbance, of which the cyclone was one feature.

"*Agurtolla*.—*Agurtolla* is 30 miles due north of *Comillah*, on the western extremity of the *Tipperah Hills*. Here nothing more than a stiff gale was experienced. The sky was cloudy on the 30th and 31st, and a slight rainfall occurred on the latter day. The

wind during the advance of the cyclone varied from north-east to north, and was not so violent as to do any considerable injury to houses or trees. Mr. Bradbury, Magistrate at Agurtolla, writes:—‘The wind here shifted very little, and blew from the north and north-west during the night and the following morning until the storm subsided. There were no gusts from the east or south or west. The storm was most violent about 4 or 4.30 a.m., and then gradually lulled, ceasing entirely about 11 a.m. It was much less furious here than at Comillah; at Agurtolla not more than 20 or 30 huts were blown down, and no lives were lost. Throughout Hill Tipperah the only serious damage done was to the crops, which, being in ear, suffered to the extent of from one eighth to one fourth.’

“*Adamtala*.—Captain Nuthall, R.N., a tea planter, residing at Adamtala, about 30 miles north of Agurtolla, and amongst the northern spurs of the Tipperah Hills, states that there was a very heavy gale of wind there on the morning of the 1st. It commenced about 2 a.m., the barometer falling rapidly until 7 a.m. 1.32 inches of rain fell on the 1st. Although the wind was very violent, it did no injury beyond breaking down some plantain trees.

“*Sylhet*.—At Sylhet, 35 miles north-west of Adamtala, there is a Government observatory, but the observer took no special observations, as the wind was not very violent there. The ordinary observations show that the 31st was cloudy, and that slight rainfall occurred at intervals. At 11 p.m. the wind was blowing from the east, and it gradually shifted to the north, from which quarter it was blowing when the gale was at its height at 4 a.m. The wind gradually abated as day came on, when it is said to have come from a little west of north. The storm was over by 10 a.m. The total rainfall was 1.24 inches. The amount of wind registered by the anemometer from 4 p.m. of the 31st to 10 a.m. of the 1st was 390 miles.

“*Cachar*.—The superintendent of the Cachar observatory, 60 miles to the east of Sylhet, and about 80 miles to the north of the angle formed by the Tipperah and Arakan Hills, states that the storm there was not severe. It began to blow from the north-east at 2.30 a.m. and continued until 10.30 a.m., during which interval 1.3 inches of rain fell. No damage was done in the station, a few old houses, however, being said to have been blown down in the district.

The above evidence is conclusive that the storm vortex not only did not reach the Tipperah Hills, but that it was broken up at a considerable distance south, and that the minor eddies which were formed by the obstructive and disintegrating action of the hills, although they continued for five or six hours after the arrival of the vortex at the mouth of the Megna, rapidly died away, and that at midday of the 1st the cyclone was practically extinguished, the only after effects on the weather being a slight rainfall during the next 48 hours in Assam and the neighbouring hills.

The following account of the cyclone at Burrisal, sent to me by the Civil Medical Officer, is the chief information I have received from the Backergunge district:—

“The weather had been cloudy for the last few days. On the 30th and 31st October slight rain occurred at intervals. On the morning of 31st October the wind blew from S.E. During the afternoon it changed to N.E. Towards evening it came from a direction nearer north and increased in strength. During the night it increased to a hurricane, prostrating trees and breaking large limbs and foliage from them. Most of these trees lie in a direction from a little to west of north. Towards morning, at about 4 a.m., the wind decreased in violence and changed to a direction from near west. Its period of greatest violence was from midnight to 4 a.m. Over 90 per cent. of the kutchra houses composing the bazar have been thrown down. In order to show the great force of the wind, I may mention that the largest portions of the north and south walls of the racquet court have been blown down in mass. This building did not suffer in the cyclone of 1867. Slight rain accompanied, but there was no thunder or lightning. An aneroid barometer on the evening of 31st October stood at 30.200. From this time it steadily fell to 4 a.m., when it stood at 29.280. The rainfall on the 31st was .36 inches and on the 30th .01 inches. No change occurred in the relative humidity of the air.”

The following table gives briefly the information sent to me by the various district officers, and whilst it confirms the path as charted from the facts given in the previous paragraphs, it is useful as supplying information defining the limits of the area affected by the cyclone. The cyclonic area extended from Saugor Island to the island of Katoobdia and the small station of Cox's Bazar. As it advanced inland it rapidly contracted, and included the whole of the Backergunge, Noakholly, and Chittagong districts, the Tipperah Hill Division, and the eastern portions of the Jessore, Dacca, and Mymensingh districts.

Districts.	Stations.	31st October 1876.			1st November 1876.				REMARKS.
		Before 10 p.m.	10 p.m.	12 p.m.	2 a.m.	3 a.m.	4 a.m.	After 4 a.m.	
Jessore -	Bagirhaut -	Cloudy - - - Raining, 4 p.m. Wind N.E.	N.E.	N.	-	-	N.W.	W.	Total rainfall 2.78 inches. Many houses blown down, and dispensary building much damaged.
	Khoolna -	Frequent showers -	N.E.	N.	N.	N.	-	-	
	Nurrail -	Strong wind Gloomy sky. Rain.	N.E.	N.	N.	N.	-	-	
	Jhenidah -	10 a.m., 29.8 - 4 p.m., 29.69 - Gloomy; occasional rain; wind N.E.	29.63 Strong gusts N.E.	Bar. 29.51. Wind N.E. Strong gusts with light rain.	Bar. 29.47. Wind shifting to N.; blowing in puffs at intervals.	Bar. 29.48. Wind N., modera- ting; rain ceased.	-	6 a.m., 29.63; wind N.W., sky clear- ing.	Fine day on the 1st, light N.W. wind; barometer rising ra- pidly.
	Jessore -	Bar. reduced to 32°. 10 a.m., 29.783 - 4 p.m., 29.663 - Wind N.E.	Bar. 29.610. Wind N.E. 109.2 miles regis- tered from 4 p.m. by anemometer.	-	-	-	Bar. 29.410; wind E.	10 a.m., 29.783; wind W.	Rainfall 1.05" during storm. The wind during the storm first blew from E. and veered round N. to W., from which it was blowing when the storm subsided.
Nuddea -	Nuddea -	Heavy clouds from early morning. 10 a.m., 29.72. 4 p.m., 29.72. Wind N.E.	Wind blowing fresh from N.N.E.	-	-	Wind increased during night.	-	10 a.m., 29.60; wind W.N.W., heavy clouds. 4 p.m., 29.63; wind N.W., with sky clear.	Rainfall 0.8 inches.
	Krishnagur -	Rain slightly. Day very cloudy and windy.	Wind N. to N.E.	-	-	-	-	-	Rainfall 0.7 inches.
	Choodanga -	Sky very cloudy -	-	-	-	-	-	-	Wind from N.E. during the night.
	Bongong -	Cloudy and rain d ing the day.	E.	N.E.	N.	-	-	-	
	Kishengunge -	28th to 31st sky cloudy; wind in gusts from N.E., with rain.	9 p.m. "Strong close reefed top- sail breeze" with rain; wind N.E.	-	Wind began to abate.	-	-	-	
	Jellinghy River Toll Office.	Wind N.E. - - -	-	N.E.	N.E.	N.E.	N.E.	6 a.m., wind veered to N.W. and W.	Sky cleared up at midday.

Districts.	Stations.	31st October 1876.				1st November 1876.				REMARKS.
		Before 10 p.m.	10 p.m.	12 p.m.	2 a.m.	3 a.m.	4 a.m.	After 4 a.m.		
Dacca	Dacca	Bar. reduced to 32°. 10 a.m., 29.806 Wind N.N.E. - 4 p.m. 29.701 Wind N.	Bar. 29.643. N.E.	12.50 a.m. 29.490. N.N.E.	Bar. 29.380. N.E.	- N.E.	-	10 a.m., 29.678; W.N.W.	Total rain during storm 1.92 inches.	
Fureedpore	Madaripore	7 p.m. to 10 p.m., N.	N.E.	-	-	-	-	-	About 6.30 a.m. the river began to rise rapidly, viz., 5 feet in three-quarters of an hour.	
Mymensingh	Mymensingh	Cloudy day	N.E.	N.E.	N.E.	-	-	-	Storm lasted until 6 a.m.; rainfall 0.26; wind gusty, but never high, and did no damage.	
	Kishoregunge	-	-	-	-	-	-	-	Rainfall 0.92; many huts were blown down and a boat capsized on the Megna.	
	Attha	S.E. before gale	-	-	-	N.E.	-	N.	Rainfall 0.08; no gale or destruction of property.	
Pubna	Pubna	Cloudy day, 1.9 inches of rain up to 6 p.m.	-	Wind blew hard and "almost a gale."	Direction of wind, N. to N.E.	-	Wind began to abate.	-	Total rainfall 0.2 inches from 6 p.m. of 31st.	
	Serajgunge	Afternoon cloudy with slight rain. Wind N.E.	N.E.	N.	-	-	-	-	7 (?) inches of rain fell during the night. Morning of 1st was fine with a light wind.	
Bogra	Bogra	No rainfall	-	Wind blew during night from E. by N., but with no excessive violence.	-	-	-	-	No rainfall.	
	Shiraghur	-	-	-	-	-	N.	-	0.15 inches of rainfall.	
Rungpore	Nowkhila	-	-	Wind stated to have come from S.E. in gusts, and to have shifted to N.E. on following morning (?)	-	-	-	-	0.3 inches rain.	
	Rungpore	Sky cloudy, wind N.E.	N.E.	N.E.	N.E.	N.	N.	10 a.m., wind strong from N.W.	On the 31st, when sky was dark, the snowy range was very clearly visible.	
Chittagong Hill Tracts	Rungamattee	Cloudy during day	-	-	-	-	-	-	Was blowing from E. at 2 a.m., and shifted through S.E. and S. to S.W. The wind was very violent from the S.W.	
	Demagiree	-	-	-	-	-	-	-	Wind commenced to blow from the E. No damage was done to houses or huts.	
	Ruma	-	-	-	-	-	-	-	Began at 10.30 p.m., and lasted till 6 a.m.; wind S.E.	

The chief feature of the storm in its passage over Eastern Bengal was the absence of heavy rainfall. There was slight rainfall over the whole of this portion of Bengal and the adjacent districts to the east on the 31st, followed by heavier rainfall during the storm on the morning of the 1st. The following gives the amount of rainfall registered on the 31st and 1st at the more important stations in the cyclone area :—

(1.)—*Stations on Eastern Quadrant of Cyclone.*

	31st October.	1st November.
Cox's Bazar - - - -	0·06	3·15
Chittagong - - - -	0·10	2·50
Fenny - - - -	0·11	3·20
Rungamuttee - - - -	—	2·00

(2.)—*Station in Path of Storm Vortex.*

Noakholly - - - -	0·26	5·12
-------------------	------	------

(3.)—*Stations on Western Quadrant of Cyclone.*

Hill Tipperah - - - -	0·05	1·92
Comillah - - - -	—	3·54
Brahmunberiah - - - -	0·06	1·51
Burrisal - - - -	0·36	3·04
Perozepore - - - -	0·60	1·81
Putuakhally - - - -	0·90	5·85
Bagirhat - - - -	—	2·78
Dacca - - - -	0·14	—
Furreedpore - - - -	0·89	—
Goalundo - - - -	0·17	0·52
Khoolna - - - -	1·03	—
Jhenidah - - - -	0·89	—

Another feature was the almost entire absence of thunder and lightning during the storm on land.

The following observations were taken on board the S.S. "Prince Alfred," which left Goalundo for Dacca on the 31st ultimo, and passed the night in the Budderchur khal, abreast of the Hilsamaree, through which the steamers go from the Pudma to the Megna :—

—	Hour.	Wind.	Barometer.	REMARKS.
October 31st	5.30 a.m.	N.E.	—	Weather looking doubtful.
	9 "	N.E.	26·86	
	12 "	N.E.	·84	Dull and dirty appearance all round.
	2 p.m.	N.E.	—	Weather looking worse. (Ran into Budderchur khal.)
	4 "	N.E.	·76	Squally from E.N.E.
	6 "	N.E.	·74	Increasing breeze and heavy rain. (Ordered fires to be banked.)
	7.30 "	—	—	
	8 "	N.E.	·72	
	10 "	N.E.	·69	Moderate gale.
	10.30 "	N.E.	·67	
	11 "	N.E.	·65	Fresh gale.
	11.30 "	N.E.	·50	
	12 "	N.E.	·49	Strong gale.
	1 a.m.	N.E.	·45	Strong gusts.
November 1st	1.30 "	N.E.	·40	Ditto.
	2 "	N.E.	·39	Heavy gale, with violent gusts and constant rain.
	2.30 "	N.E.	·38	
	3 "	N.E.	·35	Ditto ditto. (Engines at work 5 to 8 revolutions a minute.)
	3.30 "	N.E.	·34	
	4 "	N.	·34	Heavy gale, with passing squalls of wind and rain.
	5 "	N.	·37	More moderate.
	6 "	N.W.	·40	Strong breeze with gloomy weather and rain.
	7 "	N.W.	·45	
	8 "	N.W.	·50	
	9 "	N.W.	·53	
	10 "	N.W.	·60	Weather clearing up.

The following observations were taken at Chittagong, Calcutta, and Saugor Island during the cyclone:—

Date and Hour.	Barometer.			Wind Direction.			Wind Velocity.		
	Chittagong.	Calcutta.	Saugor Is- land.	Chittagong.	Calcutta.	Saugor Island.	Chittagong.	Calcutta.	Saugor Is- land.
October 31st.									
4 a.m.	—	—	29·714	—	—	N.E.	—	7	69·6
6.40	—	—	·700	—	—	N.N.E. to N.E.	—	—	—
7	—	—	·718	—	—	N.E.	—	40	47·9
8.20	—	—	·745	—	—	N.N.E. to N.E.	—	—	—
9	—	—	·726	—	—	N.N.E. to N.E.	—	25	31·2
10	—	—	·721	—	—	N.N.E.	—	15	19·3
12.15	—	—	·647	—	—	N.N.E.	—	—	40·5
1 p.m.	—	29·684	—	—	N.E.	—	—	52	—
2	—	·649	·576	—	N.E.	N.E.	—	15	38·5
3	—	·653	·553	—	N.E.	N.E.	—	18	23·8
4	—	·624	·521	—	N.E.	N.N.E.	—	20	23·4
5	—	·632	—	—	N.E.	—	—	19	—
5.20	—	—	·508	—	—	N.N.E.	—	—	39·3
6	—	·618	·485	—	N.E.	N.N.E.	—	16	25·2
7	—	·614	·477	—	N.E.	N.N.E.	—	25	34·9
8	—	·580	·475	—	N.E.	N.N.W. to N.N.E.	—	24	36·0
9	—	·558	·487	—	N.N.E.	N.W. by N. to N.N.E.	—	21	48·5
10	—	·570	·496	—	N. by E.	N.W. to N. by W.	—	19	49·5
11	—	·561	·523	—	N.N.E.	N.W. to N.	—	16	28·1
12	—	·528	·518	—	N. by E.	N.W. to N.	—	30	25·8
November 1st									
0.45 a.m.	29·283	—	—	E.N.E.	—	—	—	—	—
1	—	·514	·545	—	N.	N.W.	—	30	23·8
1.15	·205	—	—	N.E.	—	—	—	—	—
1.30	·196	—	—	E.N.E.	—	—	—	—	—
1.45	·186	—	—	E.	—	—	—	—	—
2	·191	·523	·578	S.E.	N.N.W.	N.W.	—	25	21·8
2.15	·166	—	—	S.S.E.	—	—	—	—	—
2.30	·132	—	—	S.E.	—	—	—	—	—
2.45	·102	—	—	E.S.E.	—	—	74·9	—	—
3	·081	·553	·606	S.E.	N.N.W.	N.W.	—	19	20·4
3.10	·081	—	—	S.S.E.	—	—	—	—	—
3.20	·062	—	—	S.S.E.	—	—	—	—	—
3.30	·058	—	—	S.S.E.	—	—	—	—	—
4	·062	·596	·645	S.	N.N.W.	N.W.	—	12	17·0
4.30	·124	—	—	S.S.W.	—	—	—	—	—
5	·165	·640	—	S.W.	W.N.W.	—	—	11	—
5.10	·184	—	—	W.	—	—	—	—	—
5.20	·216	—	—	W.	—	—	—	—	—
5.35	·266	—	—	W.	—	—	—	—	—
5.50	·358	—	—	—	—	—	210·6	—	—
6	·441	·682	—	—	W.N.W.	—	—	13	—
6.10	·487	—	—	—	—	—	17·1	—	—
6.20	·537	—	—	—	—	—	—	—	—
6.30	·590	—	—	—	—	—	19·5	—	—
7	·650	·712	—	—	W.N.W.	—	29·3	16	—
8	·670	·748	—	—	W.N.W.	—	28·3	18	—
9	·696	·781	—	—	W.N.W.	—	18·2	10	—
10	—	·790	—	—	W.	—	—	13	—

The Telegraph Master at Chittagong, Mr. Burke, who is also the meteorological observer, gives the following account of the storm and of the difficulties which he experienced in taking the observations:—

“On the evening of the 31st, at 16 hours, the direction of the wind had been N.E., but at about 9 p.m. it had veered round to N.W., and again when the first observation was taken it had gone round to E.N.E. At 9 p.m. the wind was not high, but would be called a pleasant breeze.

“At 0·30 hours I was required in office, owing to failure of telegraphic communication with Akyab. The wind at this time was very high and from a north-easterly direction. An observation was made of the barometer at 0·45 hours and the readings obtained reported by telegraph, immediately after which there was a total interruption to communication on both sides, and the further observations made could not be wired. It was also raining very heavily, and the rain carried by the high wind had wet all the instruments in the meteorological shed, so much so that water was running out at the bottom of the cage.

“I endeavoured to obtain readings of the dry and wet bulb thermometers, but owing to the fine spray by the dashing of the rain against the instruments and the motion of the water running down the tubes, I was unable to obtain one in the short time that the

lantern could be kept lighted. But the reading of the dry and wet bulb thermometers could not have differed, as they were equally wet.

"The same difficulty attended the reading of the anemometer, which, from its position on the roof of the building, was exposed to the full force of the storm and driving rain. After a number of unsuccessful attempts, owing to the lantern being blown out, and the difficulty of retaining my position at the edge of the parapet, a reading was obtained.

"At 1.45 hours the force of the wind had increased so much that the meteorological shed was in danger of being blown down; the instruments were therefore removed and brought into the office.

"At 2.45 hours another reading of the anemometer was made, but the force of the wind was so great as to prevent anything like accuracy in this observation. It was with great difficulty that I retained my position on the roof of the building, nor could the lantern be kept lighted more than a second or two when held up to throw light on the wheelwork.

"At 3.30 hours the masonry wall of the office, a pucca building, began to be shaken, the plaster falling off all parts. To save them from destruction, the clock and telegraph instruments were removed. I was about to remove the barometer also, the wall above it showing signs of bulging in, when a piece of plaster about 10 square feet fell in, leaving the barometer uninjured. The position of the instrument then appearing to be safe, it was allowed to remain, and the observations continued at 10 minute intervals, as well as I could guess, there being nothing to show the time. At 6 hours I got time again and continued the observations regularly till the barometer rose again to its normal height.

"At 5.45 hours I observed that the feather of the arrow of the wind vane had been wrenched off. The exact time that this happened I am unable to state with certainty, but it appears to have been just about this time, for the index, which before that had been pointing to 24, suddenly swung round from 24 to 8, or just a half circle."

The barometric observations in the table are corrected for temperature. The height of the cistern of the barometer above mean sea-level at Saugor Island is six feet, at Calcutta, 18.1 feet, and at Chittagong 90 feet.

The lowest observed reading of the barometer at Saugor Island was 29.475 at 8 p.m., when the storm centre was at a distance of 150 miles to the E.S.E. The lowest observed reading at Calcutta was 29.514 at 1 a.m. Calcutta was at the same distance from the storm centre as Saugor Island. The difference of the lowest readings (reduced to sea level) is .051. The total fall at either station was not very great; the fall at Saugor Island from 8.20 a.m. to 8 p.m. was .239 inches, and at Calcutta from 1 p.m. of the 31st to 1 a.m. of the 1st .170 inches. Thus, even before its arrival at the mouth of the Megna, the land action on its outer limits was slowly diminishing the strength of the cyclone, whether measured by the total barometric fall or the rate of fall before the nearest approach of the storm centre. Chittagong was 35 miles from the storm centre at 3.30 a.m., when it was passing over the islands of Hattiya and Siddhi. The lowest reading of the barometer reduced to sea level was 29.148 at 3.30 a.m.; it fell from 29.373 at 0.45 a.m. to 29.152 at 3.20 a.m., or .221 inches in two hours and a half. It continued at nearly the same height for forty minutes, or until 4 a.m., after which it increased very rapidly. The reading at 6.30 a.m. was 29.680 inches, giving a rise of .528 inches in two and a half hours after the time of nearest approach of the storm centre. The barometer thus rose between two and three times as quickly as it had fallen—an additional proof of the fact that has been already stated, the rapidity with which the storm was broken up after 4 a.m. and also showing, as I believe, that a considerable part of the diminution of pressure during the cyclone is due to the actual motion of the air. The wind velocities recorded in the table give the actual motion of the air indicated by the anemometers between the time for which the velocity is given and the preceding observations.

The wind velocity at Saugor Island was highest between 8 p.m. and 10 p.m., or immediately after the lowest reading of the barometer. The average wind velocity at Chittagong between 2.45 and 5.45 a.m. was upwards of 70 miles per hour. From 6 a.m. to 7 a.m. the mean velocity was 58 miles per hour, and after this it decreased very rapidly. The amount registered between 7 a.m. and 8 a.m. was 28.3 miles, and between 8 a.m. to 9 a.m. was only 15.2 miles.

CHAPTER V.—THE STORM-WAVE.

The cyclone whose origin and path have been discussed in the preceding pages will long be remembered for the unprecedented loss of life, due to the flood of waters poured over the islands at the mouth of the Megna by the storm-wave which accompanied it.

The accumulation of water at and near the centre of a cyclone is produced by a combination of causes, the most powerful of which in this case was probably the diminished air pressure. This alone would account for a rise of from one or two feet over an area upwards of 400 miles in diameter. The vorticose motion of the atmosphere in cyclones also undoubtedly tends to give a similar movement to the water over which it is circulating. The logs of the "Allahabad," "Lightning," and other vessels show that during the cyclone there were strong north-east and south-west sea currents on opposite quadrants of the cyclone, the former of which, near the head of the Bay, was probably the stronger of the two for evident reasons. This motion, vorticose in its character, would necessarily tend to pile up the water in the central area of calm. The head due to the two causes might amount to three or four feet. This mass of water advanced with the storm, and the energy stored up in it as potential energy represented a considerable amount of the mechanical energy due, as a secondary effect, to the enormous heat given out in the process of condensation over the area of rainfall in the Bay. In the case of the Backergunge cyclone, this piled-up mass of water advanced under the pressure of the acting forces towards the head of the Bay as a storm-wave at the rate of at least 20 miles per hour, and reached the shallows near the entrance of the estuary of the Megna without any change of form or character. The friction from the shallow bed then began to act rapidly and retarded its progress. The storm-wave, under the action of this suddenly encountered and increasing resistance, rapidly accumulated over the shallows near the mouth of the river. It was also, over the same area and to the north, opposed by the fresh waters of the river seeking for an oceanic outlet, and tending to advance southward under the pressure of the continuously accumulating mass brought down more rapidly than usual by the action of the northerly winds in Bengal and easterly winds in Assam. These two vast and accumulating masses of water opposed each other over the shallows of the estuary. During the struggle and contention for mastery there would be for some time a very considerable piling up of the waters immediately to the south of the islands, the land-marks of the shallows stretching to some distance southwards. This accumulation would be followed by the inrush of the larger and more powerful mass of waters forming the storm-wave, driving back the river water and advancing first in the form of a wave, carrying all before it. The character and extent of the inundation in such a case depend upon a variety of causes, and would present very different features at different parts of the estuary. The magnitude of the storm-wave, the size of the river, the wind direction and changes of direction, and the relation in time of the storm-wave to the ordinary tidal wave, must all be taken into consideration.

Before tracing more fully the progress of the storm-wave of the morning of the 1st November, it will be desirable to describe briefly the character of the district near the mouth of the united Ganges and Brahmaputra, and the nature of the tidal action in the north-eastern angle of the Bay of Bengal.

The Brahmaputra, one of the largest and least known of the rivers of India, rises in the plateau of Thibet, and drains the northern flank of the Himalayas eastward of Lake Mansarawar; it brings down at all times a vast quantity of water, its volume has been computed at Goalpara at its lowest ebb to be 146,000 cubic feet per second, representing a mass of water covering 20 square miles to the depth of one foot per hour. The Ganges brings down an almost equal volume of water, and unites with the Brahmaputra opposite Goalpara. They are joined by the Megna, and the three united streams, known locally as the Megna, after a course of 100 miles, expand into a noble estuary, studded with large islands, which form three lines, stretching north and south, between which and the mainland the river finds its way to the sea. The most westerly of these three lines of islands is formed by the islands of Badura and Dukhin Shahbazzpore, separated from the mainland of Backergunge by the Tetoolia River. In the centre are the islands of Nalchira and Hattiya, separated from Dukhin Shahbazzpore by the Shahbazzpore River, and from the third and most easterly line of islands, consisting of Sundip and Siddhi, by the Megna and the Hattiya Rivers. The Sundip Channel lies between the mainland of the Chittagong district and the third line of islands. The Shahbazzpore and Megna Rivers are the chief exits for the fresh water brought down by the united streams. The Sundip Channel, on the other hand, plays the part of a waste-water reservoir or side channel, and its waters are always more or less brackish. The surface

rises and falls with the tide, but the amount of fresh water brought down by it is always small.

The islands at the mouth of the Megna are all extremely low, and are merely the crests of an extensive and increasing alluvial deposit at the mouth of the estuary. They are formed chiefly from the *detritus* of the Himalayas deposited over the area in which the tidal and the river waters wage incessant warfare, alternately displacing each other. The following account, taken from a paper given in the "Statistical Reporter" for May 1876, describes the growth and colonization of these island accretions at the mouth of the Megna:—

"The fluvial and tidal action by which the district of Noakholly has been formed is still at work. New churs and islands appear, Degi churs as they are called, land which is under water at high tide and is visible during the ebb. These island formations gradually emerge from the water, and as soon as they cease to be overflowed by the tide, an engagement for the land at a nominal rent is entered into as a venture. When the grass and bush spring up, wild men, speaking a barbarous *patois*, come down to pasture large herds of cattle on the young herbage, putting up sheds for the beasts, they themselves bivouacking in the open. The person who has made his venture on the land now compels the cattle owners a grazing rent at so much a head a year for their cattle, and a rent for cutting fuel is taken. In course of time as the land becomes fit for the plough, the person settling for the land will get a man of energy, if not of substance, to take charge of the cultivation of as much land as possible, and will give him a lease for a number of years. This man, the pioneer of cultivation, and afterwards often a leader of a colony of resident cultivators, will induce non-resident ryots from the neighbouring districts to plough and sow the lands, and the crops will be watched and harvested from temporary huts, and the grain carted away to their permanent holdings. As time progresses and the land improves, and the cultivation is permanently extended, ryots are induced to settle on the land and become residents. They dig large tanks for fresh-water supply and raise high mounds for foundations for their homesteads in the low country (which is intersected by numerous watercourses), and plant them round with betel, cocoanut, and date palms, plantains, mandar and other trees. Thus they settle with their families, and in a generation or two the new formation has become like the rest of the district."

The tidal wave in the Bay of Bengal advances most rapidly in the deeper and central portions. The crest of the wave, which to the south of the Bay is almost a straight line running north-west and south-east between the south coast of Ceylon and the southern coast of Java, gradually becomes more and more curved as it advances northwards. The crest at the head of the Bay is convex to the shore, and the central and more advanced portion of the tidal wave travels from south-west to north-east. It thus reaches the estuary of the Megna later than any other point of the coast. The tidal current is at that time proceeding in a north-easterly direction. At and near the estuary of the Megna it meets with several channels bringing down large quantities of fresh water, and separated by long lines of low islands, which are only the highest portion of a shallow area of considerable extent. The advancing tide meets this mass of water at an obtuse angle. The action of the two opposing masses of water is somewhat complicated. The tidal wave passes onwards, slightly deflected, towards the Chittagong coast, and the fresh water in the main channels—the Shahbazpore and Megna Rivers begins to accumulate over the shallows instead of passing seawards. Thus for some hours after the tide has turned, the fresh water continues to flow down in the upper portion of the estuary, and accumulates in the channels lying between the islands, whilst the advancing tide passes onwards to the Chittagong coast and is there deflected up the Sundip Channel. Thus, on ordinary occasions there is an accumulation of salt-water in the Sundip Channel and of fresh water in the other channels—or, in other words, a salt-water tide and a fresh-water tide. The meeting place of these tides is in that portion of the Sundip Channel (sometimes called the Baumni Channel) to the north-west of the island of Siddhi and south of Noakholly. Again, when the tide is more than usually strong, as at full moon, or under the influence of a strong south-west wind, or when the river is heavily flooded, the opposing masses of waters accumulate more rapidly than usual over the shallows to the south of the islands, and then the phenomenon of the bore is produced. But whenever this occurs there are always two bores—a salt-water bore, or rush of salt water up the Sundip Channel, known as the Chittagong bore, and a fresh-water bore up the remaining channels, and called by the natives the *daula* bore. These bores, like the ordinary tidal waves, meet to the north of Siddhi. On the east, therefore, of this line of meeting and of the eastern line of islands, is the region of salt-water tide and tidal bore, and to the west the region of fresh-water tide and bore. When

the conditions for the formation of the bore are peculiarly favourable, it advances as a wall of water stretching across the channels several feet high, and is so dangerous that the native boatmen will under no circumstances venture out into the river when it is expected. As the rapid piling up of the water on the shallows which produces the bore is partly due to the retardation of the advancing tide by the shallow banks of the estuary, and partly to the opposition of the tidal and river waters, it occurs in its most violent form during exceptionally high tides, as at the equinoxes, and also when the south-west wind adds to the height of the tidal wave.

Any other action in the Bay of Bengal which tends to produce a similar accumulation of sea water at the mouth of the estuary will, if sufficiently rapid and large, be accompanied by exactly similar phenomena. Hence the piled-up mass of water at the centre of the cyclone would, by its advance in the same direction as the tidal wave, necessarily produce a salt-water accumulation of water and a bore in the Sundip Channel, and a fresh water accumulation and bore in the remaining channels.

The above explanation will make clear the phenomena of the great flood on the morning of the 1st of November over the low land at the mouth of the Megna. It was due to an unusually high tidal wave followed by the storm-wave of the advancing cyclone, and was intensified by the violent north wind which prevailed from 10 p.m. to 3 a.m. and brought down the river water more rapidly than usual, and by the south-west and west winds which immediately followed and impelled a further portion of the storm-wave into the converging water area of the estuary. It was full moon on the evening of the 31st, and there was an abnormally high tide, which flooded all the low lands along the coast of the head of the Bay. At False Point on the morning of the 31st the tide rose two and a half feet higher than on any previous day of the year, and on the same night it rose still higher, and was three feet above the top of the bund enclosing the lighthouse. In the estuary of the Megna the tide was also unusually high. The advancing cyclone tended to accumulate the salt waters at the head of the Bay. High water took place at Chittagong at 0.30 a.m. of the 1st. The usual tidal bore at full moon occurred about an hour and a half before high tide in the channels, and was followed by an inundation of the lower grounds of the Chittagong coast and the islands in the estuary. This flooding of the low lands, which took place at 11 a.m. at the entrance of the river, was due mainly to the advance of a higher tidal wave than usual, but was probably intensified by the northerly wind blowing down the river. The inundation was a salt-water one along the Chittagong coast and in the islands of Sundip and Siddhi; over the low lands of the remaining islands and the Backergunge district it was of fresh water. The direction in which the water advanced in the various districts depended, of course, on their height and position with respect to the nearest water. That the inundation, as has been stated, came mainly from the north and north-east is simply impossible. The wind and the ordinary waves at the time were from the north and north-east, but the mass of water which caused the flood came from the south, driven forward by the advancing tide, and produced either a salt or fresh water inundation in strict accordance with the ordinary phenomena of high tides in the Megna, which have been already explained. This first inundation did little permanent damage, and was not attended by any considerable loss of life. A few persons, it is believed, were drowned, but this is no uncommon occurrence in these islands at high tides.

The pressure of the advancing storm-wave prevented the tide from ebbing and the tidal inundation from flowing off. The storm-wave, like the ordinary tidal-wave, was retarded on the shallows at the entrance of the river. It accumulated there, and finally overpowered the mass of fresh water brought down by the Megna, which had been unable to find an exit seawards for the previous six or seven hours. It then rushed forwards as a salt-water bore up the Sundip Channel and as a fresh-water bore up the other channels. Mr. Porch's account of the inundation, which seems to me to be thoroughly consistent and intelligible, states that this second and greater inundation occurred at the entrance to the estuary, or at the southern extremity of the islands of Nalchiri, Badura, and Sundip, at 3 p.m., when the vast mass of water, gradually advancing northwards, flooding the whole area of the islands to a depth varying from 10 to 45 feet. It is very doubtful whether the inundation consisted mainly of a succession of vast waves, each moving forward with irresistible energy, sweeping away houses, trees, and human-beings before it. The excessive violence of the wind from the north-east, which was a marked feature of the cyclone, undoubtedly overturned the majority of the trees, and the direction in which they lay indicates the wind, and not the flood direction. The fact that the crops were only slightly injured by wind and flood, except in the most exposed parts, is utterly at variance with the statements of advancing waves from 20 to 60 feet high. There was undoubtedly a rush of water or

bore up the channels, but, with the exception of this, the water rose slowly and supplemented the earlier inundation. The tidal-wave had gradually and partially covered the crops in the more exposed districts. This shielded them from the excessive violence of the winds, and the later inundation was not accompanied by a violent rush of waters sufficient to inflict any considerable damage. Mr. Smith, Commissioner of Chittagong, does indeed say that along the Chittagong coast the wave swept everything before it, passing over the face of the country in a body of water 12 feet high. There is no statement of the time at which this occurred, and all that it appears to establish is that there was an inundation preceded by a bore-wave of some magnitude up the Sundip Channel. Mr. Peacock, Commissioner of the Dacca Division, after visiting the islands of Dukhin, Shahbazzpore, Badura, and the mainland of Backergunge, says :—" It seems " almost incredible that the crops should neither have been levelled by the wind nor " torn up by the rush of water over them." The reports of all who visited the wave-stricken districts concur in showing that in the area of fresh-water inundation the damage inflicted on the crops was marvellously small, taking into account the violence of the storm and the rapidity with which the flood waters advanced over them. It is impossible to reconcile the fact of the slight injury inflicted on the crops with the passage of huge waves 20 and 25 feet high, and until very much stronger evidence is forthcoming than the testimony of the natives of the district, who were at the time in peril of their lives, amidst a blinding rain and a wind of almost unparalleled violence in Bengal—men who are, moreover, unaccustomed to accuracy either of measurement or of statement—the accounts that they give, affirming that the inundation consisted of a succession of huge waves, carrying all before them, must be rejected as a very inadequate view of the actual phenomena. Mr. Porch's explanation is consistent and satisfactory, and is partially confirmed by some rough notes sent by Mr. Barton, Magistrate and Collector of the Backergunge district.

The phenomena of the bore certainly occurred twice, and may have occurred thrice, during the storm. The first bore was at 11 p.m., and preceded high tide; the second was about 3 a.m., occurring immediately before the arrival of the cyclone centre; the third, for the existence of which the evidence is not quite conclusive, may have occurred with the change of wind from north to north-east to south and south-west, after the passage of the cyclone vortex. Each probably consisted of a succession of waves, and was introductory to further inundation. The first wave, at 11 p.m., and the accompanying flood was the least violent in character. It covered the rice and other crops slowly before the wind had become very violent in the more exposed parts near the seashore, and thus prevented the wind from breaking down and destroying the crops, and the succeeding more violent rushes of water from tearing them up. Thus, in the districts which suffered from the fresh-water inundation, little permanent injury was done to the crops, the amount of loss in the majority of cases being less than one fourth. In Chittagong, the eastern portion of Sudaram, and the islands of Siddhi and Sundip, where the inundation was of salt water, the effects were much more disastrous. These consequences, the most serious of which were the almost entire destruction of the crops by the action of the salt water, the prolonged contamination of the atmosphere due to the slowness of decomposition in salt water, the temporary deterioration of the land by saline absorption, and the subsequent origin and rapid spread of epidemics amongst the surviving population, are very clearly pointed out in Mr. Porch's account (page 61).

Along the Backergunge coast and the islands of Dukhin, Shahbazzpore, Badura, Manpoora, and Hattiya, the inundation everywhere consisted of fresh water, except at places very near the coast, where it was very slightly brackish. The waves and inundation began at 11 p.m., and the water continued to rise until about 4 a.m., when it began to subside. The greater portion of the flood water flowed off before 8 a.m. At that time, even in the districts where the depth of the flood-waters had exceeded 40 feet, there was only from one to three feet of water left. The main body of the flood-waters thus retreated even more rapidly than it had advanced.

In the Rabunbad Islands the inundation was from 30 to 45 feet deep; the water here came in directly from the south-west. These islands, which are very low and more exposed than any other of the districts at the mouth of the Megna, suffered most severely. The flood was higher than over any other part of the wave-stricken area, and swept off 75 per cent. of the population; the trees were blown down and fearfully torn by the wind, and left leafless.

The Golachipa thana was to a considerable extent protected by the Rabunbad Islands which lay to the east and south-east. The waves here came from the open river to the north-east, pouring in until the accumulated waters reached a height of from 15 to 18 feet. The crops were very slightly injured, and are standing, to quote the Collector's

words, "in spite of storm-wave and wind. From two to three annas of the Agrahan "paddy was injured, the rest being a very good crop."

In Badura and the southern portion of the island of Dukhin Shahbazzpore the storm-wave poured in a flood varying from 15 to 25 feet high, and came directly from the west and south-west. It was therefore here due to the direct thrusting back of the large accumulation of fresh water at and near the mouth of the estuary and to the south of the islands. At the village of Dowla, in the island of Badura, the inhabitants state that the waves came from two directions—first, from the north-east, during which the water rose slowly, and afterwards with a rush from the west and south-west. The comparatively slow inundation was probably due to the gradual accumulation of the river waters, held back at the mouth of the estuary by the advancing mass of water forming the storm-wave proper, but driven down in the upper reaches of the estuary by the fierce north-east wind which blew from 11 p.m. to 3 a.m. The latter part of the inundation—the violent rush from the south-west—was evidently due to the forcing back and lifting up of the mass of fresh water piled up near the estuary by the immediate pressure of the storm-wave and cyclone, and further assisted after 3 a.m. by the wind, which then changed to south-west. In the northern half of the island of Dukhin Shahbazzpore the flood-waters poured in mainly from the north-east. During the early part of the storm this was due to the same causes as have been advanced to explain the north-east wave in the southern portion of the island. The bore and flood-waters at 3 a.m., due to the approaching accumulation at the storm vortex, would advance more rapidly up the channel than over the island itself. Consequently, due to the greater friction of the land, the main body of the flood-water would pour in from the upper half of the wide channel of the Shahbazzpore River, and thus came from the north-east, as was undoubtedly the case at Dowlutkhan.

The island of Manpoora, to the south-east of Dukhin Shahbazzpore, was one of the districts that suffered most severely. It also appears to have had a slow flooding from the north, followed by a more rapid inundation from the south-west. The flood waters were here 40 feet deep, and carried away 52·5 per cent. of the whole population, of whom the larger proportion were women and children.

The following extracts from the report of the Commissioner of the Dacca Division give fuller details of the loss of life and destruction of crops over this portion of the wave-stricken area:—

"The sub-division of Perozepore escaped the storm-wave, though some damage was done by the cyclone. A good many houses were blown down, and the Deputy Magistrate informed me that about one eighth of the crops had been injured. From what I could see, however, I think this is rather a high estimate.

"Leaving Perozepore at 11 a.m. on Monday, the 13th, Mr. Barton and I proceeded straight to the sub-division of Patuakhally, which we reached the next morning. The place is a perfect ruin, not a single hut having been left standing. The residence of the Sub-divisional Officer, his office, the Moonsif's cutcherry, the school, the lock-up, the police outpost, the sudder distillery, and the dispensary have all shared the general fate. Notwithstanding the complete destruction of the place, only one life was lost, an old woman's, who was killed by the falling of a house. The crops have been but little injured, the bazar was being supplied as usual; there was no distress, and no unusual amount of sickness of any kind. I may add that the whole of the damage was caused by the wind, the storm-wave not having penetrated so far inland.

"From Patuakhally we proceeded to Golachipa thana, the jurisdiction of which extends over about 800 square miles in the south-eastern portion of the district, and which, from its exposed position, we knew had suffered as severely as any place, not even excepting the island of Dukhin Shahbazzpore. On our arrival we found that the reports that had reached us had not been exaggerated. Three storm-waves of from 15 to 20 feet high have swept over the place, literally levelling it with the ground. Not a single hut and hardly a post was left standing, while large mandar trees and whole clumps of bamboos torn up bodily by the roots sufficiently testified to the overpowering force of the wind. It is as yet too soon to attempt to compute with anything like accuracy the loss of life which has occurred.

"From inquiries made man by man among a miscellaneous crowd of persons from Golachipa and the neighbouring villages, we ascertained that out of the total number of which their families had been composed, 41·55 per cent. had perished.

"The loss among the cattle has also been very great; I should think not less than 80 per cent.

"Amidst all this misery it is satisfactory to notice that the crops have suffered far less than would be supposed. I do not think that hereabouts the amount of damage

done will exceed four, or at the most six, annas, and this, it must be remembered, out of an exceptionally good crop.

"From Golachipa we proceeded still further south to the Rabunbad Islands, amongst which we visited Korulia, Burra Bansdia, and Kujul churs. Here the havoc committed by the storm was very much the same as that at Golachipa, except that, if possible, it was greater, the very *bhitas* (i.e., the wooden piles on which the houses are built) of the houses having been broken down. The storm-waves, judging from the drift that clung about the few trees that were standing, must have been more from 20 to 30 feet high. The loss of life has been consequently greater here than at Golachipa. The result of inquiries made by ourselves from house to house in the three churs above mentioned was as follows:—In Korulia, out of 296 inhabiting 34 houses, 225, or about 75 per cent; in Burra Bansdia, out of 146 living in 19 houses, 98, or 67·12 per cent., were dead; while in Kujul, out of 21 persons composing five families, we only found four alive. Very much the same result was obtained by the relief officer on chur Rangabolia, another of the same group of islands, where the per-centage of deaths was 76. Very few cows or bullocks have escaped. In chur Bansdia, in one house I counted nine, the property of three or four different persons; but I do not think I counted half a dozen more during the whole of my walk about the island, extending over upwards of two hours. Mr. Barton's experience on chur Korulia was exactly the same. Buffaloes being strong swimmers had fared better, but even among them the loss has been very considerable.

"Here, too, we found that the crops had been more extensively injured. In Bansdia the outturn will, I think, be about 6 or 7 annas, in Korulia 8 annas, and in Kujul 10 annas. There was a good deal of jungle about the last, and this to some extent protected the crops, and accounts for their being better than those on the neighbouring islands. The people all had rice in their houses, but it was all more or less damaged, though quite eatable, and the stocks were not large.

"The next place visited was Dowla, on the western side of the island of Badura, to the west of Dukhin Shahbazpore. This had apparently suffered somewhat less than the Rabunbad Islands; the mortality, according to inquiries at 20 houses, being 44·36 per cent.; the crops, too, were better, and we estimated the outturn at from 10 to 12 annas.

"Rounding the northern extremity of Badura, we then proceeded south down the Gayar River, landed at chur Shumbhoopora, on the west part of Dukhin Shahbazpore. The crops here are worse than we have found them anywhere, and I do not think the outturn will be more than six annas.

"From Shumbhoopora we proceeded across the Megna to the island of Manpoora, which we reached at 10.30 of the morning of the 16th instant. Manpoora is another of the places which experienced the full force of the storm, and where consequently the mortality has been great, though not so great as in the Rabunbad Islands. Our inquiries showed that in 102 families, consisting of 1,013 persons, 532, or slightly over 52 per cent., had been drowned. Considering what they were exposed to, the crops here are wonderfully good. The early *amun*, sown over about $\frac{2}{16}$ ths of the cultivated area, and now being cut, will not yield less than a 12-anna crop, while the *chuplas* and *banspati* rice, sown over $\frac{6}{16}$ ths and $\frac{8}{16}$ ths of the cultivated area, will yield probably a 10-anna and a 9-anna crop respectively.

"Leaving Manpoora we re-crossed the Megna, and landed first at the village of Kosnudee, and then at Tozumuddin, both on the east coast of Dukhin Shahbazpore. The former is in a very exposed position, and our inquiries showed that out of 114 persons, comprising 10 families, 46, or 40·35 per cent., have been swept away. The *aghani* crop is fair, and will yield about 10 annas; the later rice appears to have been more injured, and will probably not be more than a five or six anna crop.

"The next place visited was Dowlutkhan, the head-quarters of the Dukhin Shahbazpore sub-division, where we met the District Superintendent, Mr. Harris. While coming up the khall from the river, a distance of between two and three miles, I counted no less than 76 corpses, though this was the 17th day after the storm. The station is a complete wreck. The sub-divisional buildings, the Moonsif's cutcherry, the school, the thana, the lock-up, and the sudder distillery, have, together with the whole bazar, been levelled with the ground. The population being a floating one, it is impossible to attempt to estimate the loss of life that has occurred, though this must necessarily have been very large.

"The following is, I believe, a complete list of the Government officers and servants who have lost their lives:—Moonsif, rural sub-registrar, native doctor postmaster, court sub-inspector, abkaree darogah, two abkaree burkundauzes, seven constables, a mohurir of the moonsif's court, and a post office peon. Mr. P. M. Gasper, a zemindar,

and eight members of the family of the Deputy Magistrate have been drowned, besides many hundreds in the bazar itself. Up to the 17th nearly 250 corpses, in a fearful state of decomposition, have been drawn out of tanks or extricated from the *débris* of houses in the bazar itself and its immediate neighbourhood, and floated out into the river. Many more must have been swept away altogether, and there are undoubtedly many still undiscovered among the ruins of the place. The atmosphere is in many places simply poisonous; and it is wonderful that some epidemic has not broken out among the people. Most of the tanks are full of decaying matter, animal and vegetable, and it is hard to conceive anything more sickening than the smell arising from them.

"The crops about Dowlutkhan are much the same as those we saw about Kosnuddee and Tozumuddin; the *aghani* rice will be a 10 to 12 anna crop, the *aous* from 6 to 8 annas.

"From Dowlutkhan we proceeded up the east coast of the island, landing at Goneshporea, in the north-east corner of it, to inspect the crops, which are much the same as at Dowlutkhan. From thence we went to Bhola and Ruttunpore, places situated respectively about four and six miles inland on the north-western part of the island. Here there had been hardly any storm-wave, and no loss of human life, though a few cattle had been drowned.

"Our next point was Bowful. Hardly a single kutchahouse has been left standing, and though the storm-wave was not nearly so high here as in the Golachipa thana, Dukhin Shahbazzpore, and Manpoora, the loss of life has been very great. About one fourth of the entire area of the thana, 194 square miles, was subjected to the fury of the storm, and the deaths in this portion of it, roughly estimated to contain between 27,000 and 28,000 people, are computed to be about 7,000.

"The last place visited was Kujlakatty, in the Backergunge thana, where there has been considerable loss of life and destruction of cattle, though nothing so serious as in many other places.

"There are two most providential circumstances about the late storm—*first*, that the crops were not utterly destroyed; and, *secondly*, that the storm-wave, or rather succession of waves (for there were three), was composed of fresh and not of salt water. It seems almost incredible that the crops should neither have been levelled by the wind nor torn up by the roots by the rush of water over them. At first I was inclined to think that, as for some time before the waves came the water had risen steadily, they might have been merged before the former passed over them, and had not thus felt the violence of an immense volume of water being suddenly thrown upon them. But this theory, it is clear, can only apply to places over which the storm-wave or waves passed, while the crops are standing just as well in places which only experienced the force of the wind. In some places, no doubt, they were protected to some extent by surrounding belts of trees and jungle, but in many others I saw wide plains of miles in extent which had no screen of this kind. Whatever may have been the cause, it is certain that the crops have not been laid, and in this fact lies mainly the removal of anxiety as to the condition of the people. With regard to the second point, the water being fresh no injury has been done to the land, except possibly from a small deposit of sand upon it, and even this we saw nowhere. Instead, too, of all the tanks being made brackish and undrinkable by an infusion of salt water into them, we found no place where there was any want of drinking water, notwithstanding that so much of it has been contaminated in other ways. The calamity is bad enough as it is, but had the above circumstances not attended it, or had it occurred a month or two earlier in the year, it would have been infinitely worse."

Mr. Porch, Collector of Noakholly, thus describes the inundation in his district:—

"The inundation, the direct effect of the cyclone, was the cause of the catastrophe here. I therefore beg to offer the following observations and local experiences on the subject of the inundation. A map is sent herewith to illustrate the subject further. (This is included in the map of the wave-stricken districts.—J.E.)

"This part of the country, from its lowness and exposed face, as gradually formed towards the south in the Bay of Bengal, has always suffered from time to time from inundation. The tides at full moon and new moon and the equinoxes produce inundation sufficient to destroy the crops over large areas when there is a wind from the south in either quarter, and there is thus a conjunction of wind and wave. According to the time, duration, and direction and strength of the wind at these junctures the inundations assume fearful dimensions. On this subject I beg to refer you to the closing paragraphs of an article on Noakholly at page 340 of the "Statistical Reporter" for May 1876:—

"A remarkable feature of the Noakholly district is the *bore* or tidal wave that traverses the channels leading into the Megna. It makes all the water dangerous at times from the Bhowanigunge khal to the east coast of the Sundip Channel. At every full and new

moon, especially at the time of the equinoxes, the bore lasts for some days before and after, and has to be carefully reckoned with by those whose business is on the water. The tide as it runs up the Bay is confronted by Sundip and Hatiya and the churs between, and the current is divided. The main current speeds away to the right up the Fenny river, and the remainder round by the coast to the west, where, north of Hatiya, it is met by the left or counter-current, which, after swerving round Hatiya, has been deflected in that direction by the west coast. The united volume of water rushes on like a white wall from 14 to 20 feet in height, at a pace of about 15 miles an hour, until exhausted at the eastern limit above the Bhowanigunge khal, as far as Raipur on the Dacootia. The bore is the creation of the churs; but besides this there are whirlpools occasionally formed, and strong eddies and rushes of water are encountered in the channels about the islands in bad weather, especially when there is a strong southerly wind at the beginning and at the end of the rains. The water is then sometimes blown in a heap and rolled miles in on the islands and on the mainland.

“Nulchira, on the south of the island of Hatiya, suffers periodically from an inundation of salt water. It is the south-east wind for the most part that brings the salt flood on the islands and kills the crops.

“The south-west hurricanes during the equinoctial gales do much damage. In the cyclone of November 1867 the storm-wave swept right over the island of Hatiya from end to end, a distance of about 25 miles.”

“The left-hand or western tide—the Daula—is composed of rather fresh water and makes first. The right-hand or eastern tide—the Chittagong tide—is the stronger and is entirely salt, and goes round the Sandip Channel somewhat after the Daula or western tide. When the wind is in the east, or more especially south-east, the Chittagong tide floods the east and south-east coast with a salt inundation.

“This occurred at about 11 p.m. on October 31st, when all the people of the east and south-east coasts of Sundip, Hatiya, Bamni, and Sudharam thanas were put in great danger and had to get on the roofs of houses and up into trees for safety. Very little loss of life has been ascertained to have occurred then from the salt inundation from the east at the “flood-tide and bore-time” before midnight. The naib of Nilakhyi (Bhulua estate), in Hatiya, and his family were drowned at this time in four feet of salt inundation, it appears, by their house falling upon them and pressing them down into the water. Some people whose boats were wrecked at this time were drowned then also. In these coast parts people remained aloft all night on trees and house-tops or floating roofs or similar things, owing to this inundation from the east. It was this commotion in the water from the east that, with the bore, wrecked Mr. Higgins’ boat when the wind had veered from north-north-east to the east and south-east. This was a truly critical time for the station of Noakholly, but the wind changed quickly from south-east to east and north-east and kept the water off. After that the wind blew from about 3 or 3.30 a.m., or after, from the south-west and west (below the Megna across the islands), and drove ahead all the fresh water and diluted salt water of the Daula tide heaped up in the channels of the Megna by the wind blowing from the north and the tide pressing in from the south. The south-west and west wind lifted up all this water and drove it over the channels and the islands from the south-west to north-east at about 3 a.m. or 3.30 a.m., or 4 a.m., according to locality, carrying away almost everything in that direction, and thus inundated all South Noakholly, viz., the islands on the south and the mainland to the north up to the dotted line in the map (which corresponds nearly with the main road running across the district from Raipore west to Lalgunge east), except near the mid-Fenny tract, where from lowness and river-face exposure, the water was carried up further north by the wind and the tide. Here the bulk of the countless dead of all descriptions and *débris* of houses were swept up, but were again for the most part carried out to sea as the tide flowed back to the south and south-east.”

“Fortunately, the cyclone blew from north-east against the tide during most of the time the tide was flowing in (people felt themselves safe then). Towards the end of the ‘joar’ or flow-tide the wind turned, as before stated, and lifted up and carried the heaped-up half fresh water of the western channel over the exposed country, part of which had already suffered from the salt inundation from the east. It flowed on over islands, churs, channels, and became salter as it went north-east, where it dashed in over the banks of the Fenny and the Chittagong coasts on the east.

“Had the cyclone, just as it blew, taken place four hours earlier, the station of Noakholly would, there is reason to believe, have had 20 feet of water over it, and the inundation would probably have reached the old factory road above Begumgunge, Gopgunge, and Dewangunge. Along this line there are many very highly-embanked

tanks, probably made scores of years ago to meet a calamity of this kind, as the result of experiences that have long since been forgotten, but revived by this recent disaster; moreover, in that case the inundation would have lasted some hours longer, and the destruction of property and life would have been proportionately greater than it has been owing to the rapid subsidence of the flood, as the wind at Noakholly veering to the north at about 6.30 a.m., just after the turn of the tide, helped to carry off the flood, and then gradually fell. A consideration of the facts noticed about wind, tide and time, and physical features of the country make this seem probable.

“Looking at the line of very highly embanked tanks of great size along the old factory road, it would seem that, with a view to meet the calamity of a wide-spread salt inundation, such tanks were dug and embanked in former days, when the sea or river coast was many miles inland on the north. A cordon of the existing tanks along the lower road, the line of the recent inundation, should be highly embanked to supply fresh water to the coast people in case of a like visitation in future.

“As such cyclones may occur at these seasons, this part of the country will always be liable to flood by inundation, especially at the time of the equinoxes. The autumn flood in Kartik (October and November) will be most destructive in its after effects from its saltiness, which will bring much cholera and other disease, and will destroy most of the produce. The spring flood in Jyesta (May and June) would be the highest probably, and would cause more loss of life by drowning, owing to the rivers and the estuary being very full then, but it would be a comparatively fresh-water overflow, much less brackish than the autumn flood, owing to all the fresh rivers converging on the Bay, and largely diluting the salt water; so that the after consequences of a flood then, with the rains immediately following, would be less disastrous to the country at large than the comparatively less volume of the salt inundation of the autumn.

“The great inundation at 3.30 a.m. in the south and at 4 a.m. in the north of the islands, and 5.30 a.m. at the station of Noakholly, was caused by the very high tide at the full moon with the Chittagong bore and the Daula bore, and was very much increased by the commotion caused in the Bay from the changeableness of the wind and probably from the previous stormy weather out in the Bay. This had caused inundations on various parts of the coast at about 11.30 p.m. of that night. The wind from the north-east in the first part of the storm had also driven down much of the fresh river water from the Megna and other rivers into the channels of the estuary, where it was heaped up by the pressure of the incoming tide, causing considerable inundations on the coasts of these islands. When the wind veered round to the south-west and west at about 3.30 a.m., 4 a.m., and 5 a.m., according to their position (at Nulchira, furthest south, it blew from the west at 3.30 a.m.), it forced this mass of water from the estuary of the Megna over the adjacent country and islands, causing an incursion of the river and the sea from the direction of the south-west to the north-east. This caused the destruction of property and calamitous loss of life. What saved the people and cattle from almost universal destruction over even a further area north of Noakholly was, first, the cyclone did not blow from south during the flood tide; it did not blow long from the south-west and west, and then only towards the end of the inflowing tide. The ebb soon came and the water run off. It occurred only two or three hours before daybreak, and there was clear moonlight then. It was full moon, so there was moonlight all night everywhere, except when the different localities were darkened by the storms of rain.

“From this it will be understood how that inquirers from survivors in Hatiya, Sudharam, and Bamni might hear that at one time in the night salt water came and inundated the houses and tanks, and that a few hours after a fresh-water flood came. At Hudrakhal, east of Sundip, at 11 p.m., by the east wind and heavy sea breaking in, four or five *gada* boats were loosed from their moorings and swept away with the men on board. People then had to climb up trees and remain there to save themselves until next day. One man stated:—‘It was about midnight; the sea was very high and ‘tossing about and coming in over the coast. I was up in a tree, and as the wind blew ‘from the east and south-east, the water came rushing in, and with such force that I ‘thought no place would be safe and nothing would be saved. I saw a large mass ‘of water like the bore coming up the river as high as the tree I was on. I expected ‘to be soon swept away by this water, but the wind suddenly came down from the ‘north. It looked dark as it dashed against the wave, and both wind and wave stood ‘still for a time opposed to each other, and the wave rose up to 60 feet high and then ‘fell back, driven by the wind to the sea, and so I escaped.’ It does not appear to be correct to speak of the flood (between 3.30 a.m. and 5.30 a.m., according to locality)

in the second part of the cyclone from the west as a 'storm-wave,' for the water came on advancing and rising like the tide. It was a regular inundation, and not a mass of water like a 'storm-wave,' or like 'the bore,' though it sounded something like the bore as it flowed in. It was a storm-wave in the correct sense of the word which wrecked Mr. Higgins' boat at 11.30 p.m., or midnight, during the first part of the cyclone, when blowing from the east and south-east."

The following extracts describing the character and extent of the inundation along the Chittagong coast are taken from a report submitted to Government by the Commissioner of the Chittagong Division :—

[Will be found reprinted in extenso at p. 15.]

The inundation of the Chittagong and Noakholly coast districts, and of the islands of Nulchira, Hatiya, Sundip, and Siddhi, was in one part fresh water, and the other salt water, with an intermediate region along the Noakholly coast, where the flood became more brackish towards the east.

The mainland of the Noakholly coast along the borders of the Megna to the west of Noakholly and chur Sikander, and the islands of Nulchira and Hatiya, experienced only a fresh-water flood, whilst the area to the east of these, including the eastern portion of the Noakholly district along the Sundip and Fenny rivers, the Chittagong coast districts, as far south as the island of Kootubdia and Cox's Bazar, and the islands of Sundip and Siddhi, had throughout a salt-water inundation.

The reports given above, and the information supplied by Baboo Sreenath Ghose (p. 44) show that the inundation commenced about 11 p.m., and was due to the high tide. It was preceded in this part by the usual bore, the Chittagong (salt water) bore, which flooded the whole of the low-lying districts nearest the coast. This was followed by the greater inundation due to the storm-wave, which began from 2 a.m., and continued to pour in water until 6 or 7 a.m., according to the position of the district with reference to the cyclone vortex. It came on slowly at first in the more westerly districts, as in the Backergunge districts, but with the change of wind to south and south-west the flood waters were poured in very rapidly from 3.30 a.m. to 4.30 a.m. or 5.30 a.m. This second and further inundation was preceded and probably accompanied by large waves resembling the usual bore in character, due, first of all, to the storm-wave overpowering the accumulating waters at the mouth of the estuary, and afterwards to the change of wind driving up the waters into the confined channels of the estuary. There were thus probably three great rushes of water during the storm; the first, at 11 p.m., in advance of, and due to, the tidal wave; the second, between 2 a.m. and 3 a.m., preceding the arrival of the crest of the storm-wave at the entrance of the estuary; the third, between 4 a.m. and 5 a.m., produced by the action of the south wind pressing an additional portion of the mass of the storm-wave into the confined channel of the Megna, and causing a further increase of the inundation. These appear to be the three waves or rushes of water which Mr. Smith, the Commissioner of Chittagong, describes as occurring along the Chittagong coast. The character of the inundation at the various parts of this area is intelligible by taking into account the action of the accumulating river-water in the estuary, the tidal wave at midnight, the cyclone wave, the crest of which advanced with the calm area at a rate of about 20 miles an hour, and reached the entrance to the estuary at 3 a.m., and the change of wind from north-east to south-west over the greater part of the estuary with the passage of the storm centre.

Along the Chittagong coast the flood-waters came entirely from the west and south-west. In the more southerly of the islands, including Sundip, Nulchira, and South Hatiya, the inundation came mainly from the south-east. This direction was partly determined by the wind direction on the eastern quadrant of the cyclone, and partly by the north-eastward motion of the advancing mass of the storm-wave at the entrance to the channels by the side of the accumulating river-water to the north, which tended to pile up the waters along the Chittagong coast, from which they spread to the north and north-west. The flood at Siddhi, as in the northern portion of the island of Dukhin Shahbazpore, was mainly due to the accumulating mass of river-water held back in the lower reaches by the storm-wave and driven down in the upper reaches by the violent north-east wind. The inundation here began from the north-east at 2 a.m. Afterwards, when the cyclone had passed over the island, bringing with it the crest of the storm-wave, the flood-waters came from the west and south-west. At Noakholly, and in the districts bordering on the Fenny river, the flood poured in before 5.30 a.m. was not very considerable. But at this time the crest of the storm-wave was to the north of Siddhi, and the mass of waters brought forward by it advanced from the south and flooded rapidly the whole of this district. The effect of the north-east wind in

bringing down the river-water is shown by the character of the inundation at Ramgunge, some miles to the north of the district directly flooded by the tidal and storm-waves. Here the fresh-water flood was due to the wind bringing down volumes of river-water which found its way up the numerous channels, and refilled the dried-up khals and marshes and the surrounding lowlands which form the natural drainage of the district. This caused a flooding of the country and a disturbance of the ordinary conditions of surface water and subsoil moisture at this season. The rice crops have been considerably injured, and the public health has suffered much from choleraic disease.

The following is the report of the Master Attendant of the port of Chittagong of the storm and inundation :—

“The barometrical readings for two days previous to the passage of the cyclone registered indications of a change of weather, as it fell from 29·90 at 4 p.m. of Monday the 30th October to 29·69 at the same time of Tuesday following. Measures were therefore adopted to warn the shipping in time; but, owing to the storm-wave, the vessels started their anchors, which necessarily resulted in their dragging, and ultimately getting ashore. Rain was much wanted, and had been anxiously awaited for weeks past to perfect the fine and promising crops into yielding a rich and abundant harvest; and the weather, which had been overcast for some days previously, at last seemed to betoken the much-invoked rain which is customary at this season of the year.

“Towards 8 p.m. of the 31st ultimo, however, it became evident that more than rain portended. The wind was blowing in ‘fitful gusts’ from the north-east, a most suspicious quarter for the time of year. The barometer stood at 29·75, showing a downward tendency. There was little or no scud at this time, and the clouds had a slow rotatory sort of progression from east to west. Thunder was occasional, and the lightning was forked and very vivid, the wind increasing at each gust, and the barometer falling steadily. At 11 p.m., after a lull, the wind suddenly shifted east. So the weather continued till 2 a.m., by which time the storm had developed into a perfect hurricane, the wind increasing, and the barometer still falling, when, with a shift of wind to east-south-east, trees, houses, godowns were all now being torn to pieces by the violence of the wind; yet most of the people remained at home, and the shipping, notwithstanding the wind, still held on in safety to their anchors. Within 30 minutes afterwards the wind had shifted to south-east. The rain was driven before the raging of the tempest into a dense mist more impenetrable than darkness, and the terrors of the cyclone which swept over the port were enhanced by finally culminating in a storm-wave. It was high water at 12.30 a.m., and the tide, which should have ebbed for two hours, suddenly rose three feet above the Government road (which is considerably higher than the adjacent lands and high-water-mark). The vessels started from their anchors and were drifted about at the mercy of the wind and waves, the latter of which in a short jumping sea broke over the largest vessels in port. The vessels were fouling one another, and, as a consequence, the port was soon entirely cleared of its shipping, save one American barque, which happened, strange to say, to have been anchored in shallow water. People were in water from their knees to their armpits; their houses were inundated as well as roofless, and now the great loss of life occurred. The wind at 3.30 a.m. shifted to south-south-east. The barometer was down to 29·27, and so continued to fall to 29·25, the cyclone all the time raging with the greatest fury and devastating the whole place. At 4.30 a.m. the wind veered south, the barometer having risen to 29·29, but the wind continued unabated to carry all before it till 5 a.m., when it again shifted to south-south-west; barometer 29·35. At 5.30 the weather showed the first faint symptoms of clearing: wind at south-west, barometer risen to 29·45.

“By this time, however, all the vessels except one had dragged their anchors and were aground on the northern bank of the river; some of them had lost boats, some their rudders, and all had sustained damages of a more or less serious nature, and one had sunk in the river.

“The jetty had been carried away and was a complete wreck; the departmental boats were long since stranded far inland; the shores were strewn with the results of the cyclone, carcasses were lying about, bodies drifting in the river, and people struggling for life in the water.”

The following extracts from Sir Richard Temple’s report to the Government of India of the cyclone and storm-wave give a graphic description of the appearance of the wave-stricken area a few days after the cyclone, and furnish the only authoritative statement yet published of the probable loss of life :—

[Sir Richard Temple’s Minute will be found reprinted in extenso at page 2 of the present paper.]

CHAPTER VI.—THE CAUSES OF THE BACKERGUNGE CYCLONE.

The following is a very brief summary of the more important features of the origin and progress of the cyclone. On the 20th and following days there was almost uniform distribution of pressure in the Bay and Northern India. The pressure then increased to the north of the Bay, and was probably high to the south. The south-west monsoon, instead of retreating southward, continued to prevail over the sea region near the entrance to the Bay. The weather was fine and clear over the greater part of the Bay at this time, except in the south, where slight rainfall commenced. The wind directions were north and north-easterly on the west side of the Bay, and westerly to southerly on the south and east limits of the Bay. An area of diminishing pressure began to be formed on the 23rd. Constant precipitation of rain on the south-east accompanied its formation and gradually increased in amount. The area of depression extended northwards, and on the 26th and 27th the winds in the neighbourhood of the area began to show a vorticoose motion and were of considerable intensity, if, as I believe, the Nancowry returns can be accepted as indicating a general cyclonic motion comparable with the wind velocity registered at that station. This area of diminishing pressure extended northwards during the two following days, whilst at the same time its vortex was also advancing slowly in the same direction. With the continuance of the cyclonic conditions the area of diminishing pressure not only expanded, but the amount of the depression at its centre increased, and on the evening of the 29th the gale of cyclonic character, which had set in some time previously and was rapidly increasing in violence, became at length a cyclone of great force. Its vortex was in latitude 14° N. and longitude 89° E. at noon of the 30th, and was then advancing slowly north at a rate of about seven miles per hour. Its velocity gradually increased, and it also acquired during its progress, very slowly at first, an eastward motion. It crossed the 20th parallel of latitude in longitude $91^{\circ} 45'$, and at this time was being rapidly deflected to the east. It reached the islands at the mouth of the Megna with a velocity of progression of upwards of 20 miles per hour at 3 a.m. on the 1st. The central area of calm was then from 15 to 18 miles in diameter, and was probably elliptically shaped, its greater axis being nearly at right-angles to its path. The cyclone at sea extended over a very considerable area, blowing with hurricane force and disabling vessels at a distance of 200 miles from the vortex. In its brief passage on land its dimensions were much more contracted. It advanced to the north-east from Noakholly at 4.30 a.m., but at this time its north-eastern quadrant extended over the Tipperah Hills. They consist of a series of wave-like crests or elevations running north and south. These numerous ridges presented a formidable barrier to the rotation of the wind on the north-western quadrant. They quickly broke up the regular cyclonic motion of the wind on this side. The cyclone was completely dissolved by 10 a.m. of the 1st, the only evidence of its existence a few hours after being a slight barometric depression over the Tipperah Hills, Cachar, and Assam. There was a cloudy sky, with slight rainfall in the hill districts and in Assam on this and the following day. In the centre and north of the Bay there was calm weather, a clear sky, and a smooth sea, where from 12 to 24 hours before the wind had been blowing with hurricane force, the rain falling in torrents, and the sea tossing about in the wildest confusion. At noon of the 1st the only evidence at sea of the passage of one of the fiercest cyclones which has visited the coast of Bengal were some 20 vessels, the majority dismasted and reduced to mere wrecks, struggling feebly towards the nearest port; whilst a few scattered sheets of water on land were all that was left to indicate that the panic-stricken, houseless, starving inhabitants of one of the richest and most populous districts of Bengal had been visited by a flood more destructive in its character than history has yet recorded.

The origin and formation of the cyclone can be explained by the same theory as I have already advanced in the case of the Vizagapatam cyclone. On the 20th there was almost uniform pressure over the Bay and the adjacent coast regions. The pressure was slightly in excess both to the north of this large area and also to the south. The two great lower atmospheric currents, which alternately blow over the Bay during the monsoon periods, were at that time neither in full possession. Each occupied a portion of the Bay. The south-west monsoon was gradually retreating southwards and blowing with diminished force, whilst the north-east trade wind, as yet very gentle in its character, had only advanced over the northern and western coasts of the Bay. It was a period of transition and of gentle winds, local rather than general in their character. The Bay thus became a closed area, so far as its atmospheric changes and motion are considered, whilst round its limits there was a near approach to a gentle cyclonic motion of the air. These conditions continued during the next 11 days. It is at all times an area of rapid evaporation. The Madras published observations, although in this one

point not accurate from acknowledged defects in the construction and position of the registering instrument, show that in this month, notwithstanding that it is a cloudy period and accompanied with an average rainfall of 10", the mean daily evaporation is .2". On the 20th and following days a clear sky and warm weather prevailed over the greater part of the Bay. Evaporation was probably taking place at a much more rapid rate than the above. The amount of heat absorbed by the conversion of this amount of water daily over so large an area as the Bay of Bengal is enormous. Roughly estimated, it is equal to the continuous working power of 800,000 steam engines of 1,000 horse-power. This will give some idea of the enormous amount of energy absorbed or rendered latent in the process of conversion of water into aqueous vapour over a large area like the Bay of Bengal. There was thus a process of absorption of heat, and therefore of mechanical energy, by the atmosphere over this area, compared with which even the energy of the moving mass of air during the cyclone and of the disturbed and elevated water surface over which the cyclone passed was small. There was no horizontal outlet for this accumulating aqueous vapour. Hence, instead of passing away from the producing area, to fall as rain over Southern India and other regions to the north or south, it ascended or expanded vertically upwards. The very slight rainfall at Madras and over Southern India seems to establish conclusively the condensation of the vapour over the producing area. The rainfall at Madras, which occasionally exceeds 20" during the month and averages 10", was only 1.04" for the month. The relations of aqueous vapour with respect to temperature and height are, as I have already stated, such that an equilibrated mass or atmosphere of saturated vapour of density diminishing with the height in accordance with the laws of hydrostatics or hydrodynamics is impossible. Before complete saturation can occur in the lowest strata, condensation will necessarily commence in some higher stratum, determined by the rate of decrease of temperature with the height. Hence it may be laid down as a general principle, that if over any area of constant evaporation there is not for any considerable period an atmospheric current of sufficient intensity to carry off the aqueous vapour as fast as it is produced (which outflow may take place either in the lower or higher atmospheric strata), condensation must occur over the producing area, and also that the process of evaporation and subsequent condensation will be accompanied by the formation of an area of diminishing atmospheric pressure. The meteorology of the region of Calms is a striking illustration of these facts. In this narrow belt of continuous low barometer between the two trade winds the lower winds are very light and variable, whilst daily during the period of greatest evaporation there is heavy precipitation of rain.

During the continuance of these conditions which have been shown existed over the Bay from the 20th, the Bay was in a state resembling the Belt of Calms. Rapid evaporation went on, accompanied with increasing rainfall. This rainfall, as I have already pointed out, is necessarily, according to this explanation, greatest on the south side, because here the gentle wind current from the Indian Ocean on the south pours in large quantities of vapour, and thus hastens and increases the condensation on this side. The region of disturbance, with the continuance of the favourable conditions, consequently extends northwards from the southern limits of the Bay and becomes an area of diminishing pressure, just as in the Belt of Calms the continuance of the two actions of continuous evaporation and condensation over the producing region makes it a region of persistent low pressure.

Perhaps it may be urged against this, as I believe has been done by Dr. Hann, one of the greatest European authorities on all meteorological questions, that the observations at land stations within the tropics show that continuous rainfall is not accompanied by a diminution of pressure. The returns of the observations in India undoubtedly show that on land the barometer generally, but not universally, falls previous to rainfall and rises during the rainfall. But the conditions of a closed area, such as the Bay of Bengal was at this time, and the Belt of Calms is at all seasons, are so different in every respect from any land area in the tropics, except, perhaps, small islands far removed from any continent, such as the Mauritius, or even the Andamans or Nicobars, that this fact is no argument against the present theory. So little is known of the action and independent motion of the aqueous vapour in the atmosphere, and of its relations to the atmosphere of dry air, that in such a case we can only argue from the strictest analogy. The atmospheric pressure in the Belt of Calms is always lower than in the neighbouring regions of the trade winds to the north and south, and for the same reasons, whatever they may be, the southern portion of the Bay, with the prevalence of similar conditions, became at this time an area of diminishing pressure.

I might also refer to the low pressure of the great southern oceanic area as compared with the northern land area, and to other similar facts, in confirmation of my opinion.

Probably, however, it will not be considered as satisfactorily established until hourly or continuous observations for a lengthened period at some small oceanic island have been carefully analysed, and the materials for this are not at present at my disposal. A cursory examination of the observations at Sagar Island, Port Blair, and Nancowry seems to confirm my theory for oceanic closed areas. The action appears to be as follows. The evaporation over a closed area is attended by an upward expansion or vertical current, imperceptible of course to any instrument or observation. If this did not take place, the atmospheric pressure would, and must, increase. The first tendency of evaporation is undoubtedly to increase the pressure, but this, by disturbing the equilibrium, or the previous condition of motion, causes further motion, which in this case is vertical expansion. The same cause thus produces two effects opposed to each other, so far as their action on the atmospheric pressure is considered. The resultant action is a differential one, and, as in the case of the ordinary barometric tides, the balance is in favour of the expansive action; or, in other words, the cause, evaporation (just as the solar heating power in the case of the diurnal barometric tides), which first produces or tends to produce increase of pressure is actually followed by diminution of pressure. A similar argument obtains in the case of condensation and precipitation of the aqueous vapour as rain. An unknown portion of the heat given off during the process of condensation is undoubtedly radiated off into space. Some portion of it must, however, be absorbed by the surrounding air. The first tendency of this will be to increase the pressure of this portion of the atmosphere, and therefore of every other portion. This, however, will be followed by the usual expansive action, and the question then simply resolves itself into which of the two opposing actions, increase of temperature and expansion, produces the greatest effect on the pressure. In certain cases it may be the former, and that there is therefore increase of pressure with rainfall. In closed oceanic areas, where the action is continuous (like the action of the sun on the atmosphere in producing the diurnal changes of the pressure), it seems to be more consonant with analogy to assume that the resulting action will be diminution, and not increase, of pressure.

For the reasons already stated, I assume that the evaporation in the Bay of Bengal over a closed area of uniform pressure which commenced on the 20th was followed by condensation, greatest on the southern side, where the action of evaporation in saturating the atmospheric strata was supplemented by the south-westerly current from the Indian Ocean, and that both these actions produced the same effect—diminution of pressure, which commenced to the west of the Nicobars and gradually extended northwards. It is, then, easy to see how the continuance of these conditions in the Bay would produce a cyclone. The *ascendant courant* due to the action of evaporation and condensation was greatest over a small area near the Nicobars, and the centre of the area of diminishing pressure was also there. A strong indraught from the neighbouring districts followed. There, however, was no violent change or subversion of the winds in or around the Bay at the time. The atmospheric circulation was already cyclonic in its character, and the formation of the area of low pressure implies only an increase of this motion, and an advance from all sides, or closing up towards the centre. This assisted in maintaining and increasing the vertical ascent at the centre. The continuous rainfall, due partly to the indraught from all directions, also added fresh energy to the forming cyclone. Finally, from the combination of all these causes and actions, and their persistence for a week or ten days, the cyclone was fully formed. It advanced at first slowly, but gradually increased in velocity in its passage over the Bay, and then, after reaching land, rapidly broke up, partly from the friction with the land, which, however, appears to be a very slight cause, but chiefly from the irregularity of the land action, tending, especially where it is hilly, to break up the large cyclonic motion into small eddies, which rapidly die away, and partly from the diminution of evaporation and rainfall in its passage over the land surface. It will thus be seen that the theory advanced to explain the origin and formation of the two cyclones in the preceding pages is quite different from that put forward by Mr. Meldrum to account for the cyclones of the Indian Ocean, and adopted by Mr. Willson in his cyclone reports. As the subject is an important one, I shall refer briefly to Mr. Blanford's examination of the Calcutta cyclone of 1867, the first which he investigated with the aid of accurate and abundant observations. A brief summary is given in the Proceedings of the Royal Society, vol. XVII., for the year 1869.

1st. Mr. Blanford states that for four or five days previous to the formation of the cyclone vortex the atmospheric pressure to the westward of the Nicobars was lower than elsewhere around the Bay, and that round the northern and western coasts the differences of pressure were very small.

2nd. That the winds were variable in Bengal some days previous to the cyclone, but become north and north-west three days before its formation; and that the light south-easterly winds which had prevailed along the west coast of the Bay also changed to north-easterly gentle winds three or four days before the formation of the cyclone.

3rd. The formation of the vortex was formed by the indraught of three currents—a north-east current on the west coast, a south-west current on the south, and a south-east current on the east—towards a region of low pressure produced by the action of evaporation and condensation; but was mainly and finally determined by the inrush of a saturated westerly current towards the area of low barometer.

The first and second conditions are equivalent to uniformity of pressure at a period of transition, which I have pointed out existed prior to the two cyclones I am dealing with, and the third to the general cyclonic motion of the atmosphere round the limits of the Bay, such as must occur at the period of transition from the south-west to the north-east monsoon. The only difference that may exist between Mr. Blanford's theory and mine is in the order and relation of the causes. The primary one is evaporation and condensation in a closed area, over and round which there is almost uniformity of pressure, and the formation of the cyclone due to this is promoted and intensified by the general cyclonic circulation around its limits, and by the saturated current passing in on the south from the Indian Ocean.

I am unable as yet to decide whether all cyclones in the Bay of Bengal present the same general meteorological phenomena and admit of the same explanation.

The most difficult point in connexion with the cyclones of the Bay of Bengal is to assign an adequate reason for their line of advance from the area of cyclone generation to the coast of the Bay. The majority of cyclones appear to originate in very nearly the same portion of the Bay over a small area, latitude 14° N., longitude 89° E., to the west of the Andamans, for reasons similar to those assigned for the formation of the recent cyclones in this area. But starting from the same central area of cyclone generation in the Bay, cyclones travel in very different directions, varying between W.N.W. and N.N.E. Those whose paths have been chartered by the Bengal Meteorological Office during the last five or six years present one common feature. They all travel in paths very approximately straight lines in their passage over the Bay, advancing from the area of cyclone generation along the line of least resistance to their motion towards the head of the Bay. If the producing causes are not persistent for a long enough period, or are small in amount, the cyclonic disturbance dies away and never reaches the coast. But in all cases where they advance as far as the coast, they apparently never suffer deflection until they approach or reach the coast. The modifying cause in the deflection of cyclones on land is not terrestrial friction, which is probably not much greater or much more irregular than the friction of the confused and disturbed water surface over which the cyclone advances. The great modifying cause is, in the case of the cyclones of the Bay, the obstruction of mountain masses and ranges. The effect of this obstructive and disintegrating action is too strikingly shown in the case of the recent cyclones to admit of dispute. The determination of the line of least resistance to the motion of cyclones is of great importance, as it would afford a sure basis for cyclone prevision. The discussion on the causes of the recent cyclones has shown that they originated from the formation and development of an area of low pressure, commencing at the south of the Bay and extending northwards. This alone would give a reason for their advance from south to north. They have also been shown to be produced by evaporation, condensation, and rainfall over a closed area. Unfortunately there are no returns of rainfall over the sea area during the advance of a cyclone, and it is impossible therefore to infer the character of the distribution of the rainfall over the region of the moving cyclonic disturbance in the Bay. The distribution of the rainfall over the land area of a cyclonic disturbance is due to very different causes and affords little or no information on this important point. As far as can be judged from the general description of the rainfall in the logs of the vessels, it appears that in the outer limits of the cyclonic disturbance the rainfall is greatest (*i.e.*, the rate of fall is greatest) on the southern quadrant, and that nearer the centre it is greatest on the eastern quadrant, and very near the vortex, it may be greatest on the north-eastern or even on the northern quadrant, and therefore in advance of the cyclone vortex. The action consequent on the giving out of the latent heat due to condensation is, however, on the whole greatest on the southern and eastern quadrant, and hence a second probable cause for the determination of the cyclones to some direction between west and north. The only other key to the determination of the line of least resistance to the cyclone motion appears to be the distribution of pressure around the coast. Here

again, from the very brief period during which meteorological observations have been taken round the Bay, the materials for consideration are much too limited to afford data for generalization. A comparison of the distribution of pressure round the coast of the Bay at the time of the formation and first advance in the case of five cyclones shows that in four out of the five it was lowest at that part of the coast which the cyclone afterwards reached. It remains to be seen whether subsequent additional knowledge will confirm this inference, that the line of least resistance is indicated partly, if not entirely, by the distribution of pressure round the head of the Bay, and that the path of the cyclone is usually from the area of cyclone formation in some direction between west and north to that part of the coast where the pressure is relatively lowest at the time of its formation.

No. 7. of 1877.

DESPATCH from the GOVERNMENT OF INDIA to the SECRETARY OF STATE FOR INDIA,
Department of Revenue, Agriculture, and Commerce, Meteorology.

MY LORD MARQUIS,

Simla, the 19th April 1877.

IN continuation of our Despatch No. 4, dated the 8th December last, we have the honour to forward, for your Lordship's information, copy of a further letter* from the Government of Bengal, containing a Resolution recorded by the Lieutenant-Governor regarding the mortality from the storm-wave of the 31st October 1876, and subsequently from cholera, in the districts of the Chittagong Division.

*No. 900, dated the 27th March 1877.

We have, &c.

(Signed) LYTTON.
F. P. HAINES.
E. C. BAYLEY.
A. J. ARBUTHNOT.
A. CLARKE.
J. STRACHEY.
E. B. JOHNSON.
W. STOKES.

From the JUNIOR SECRETARY TO THE GOVERNMENT OF BENGAL to the SECRETARY TO THE GOVERNMENT OF INDIA, Department of Revenue, Agriculture, and Commerce.

SIR, Calcutta, dated the 27th March 1877.

I AM directed to submit herewith, for the information of his Excellency the Governor-General in Council, copy of a Resolution recorded this day by the Lieutenant-Governor regarding the mortality from the storm-wave of the 31st October 1876, and subsequently from cholera, in the districts of the Chittagong Division.

I have, &c.

(Signed) H. J. S. COTTON,
Junior Secretary to the Government of Bengal.

RESOLUTION of the GOVERNMENT OF BENGAL.

READ— Calcutta, the 27th March 1877.

A memorandum, No. 662G, dated 13th March 1877, from the Commissioner of the Chittagong Division, submitting reports from the District Superintendent of Police in Chittagong, and the Magistrate of Noakholly, regarding the mortality in those districts from the storm-wave on the 31st October 1876, and subsequently from cholera.

THE total mortality in the district of Chittagong is now estimated, after careful police inquiries, to have been 2,857 from the storm-wave, and 44 from the effects of the cyclone, in those villages to which the storm-wave did not penetrate. As many as 7,399 persons are estimated to have died from cholera between the date of the cyclone and the 31st December 1876. But it is known that the epidemic of cholera continued

without abatement for a considerable period after this latter date, and the Lieutenant-Governor is still awaiting the submission of a final report on the subject, which has been called for from the Commissioners of both Chittagong and Dacca.

2. In the district of Chittagong there was not a succession of storm-waves such as occurred in Noakholly and Backergunge, but in the villages along the coast, and especially towards the north of the district, there was very great destruction of property and considerable loss of life. On the sea-coast, near the town of Chittagong itself, heaps of straw and thatch were found on the branches of trees 18 feet from the ground, and this would appear to have been the height of the storm-wave all along the coast north of the Kurnafoolee. The destruction of property at the port was great; every vessel in the river, except one, was stranded; houses were blown down in great numbers, and half the rice crop of the district was lost.

3. In the district of Noakholly the deaths caused by the cyclone and inundation on 31st October 1876 are numbered at 43,544. The deaths from cholera from that date to 31st January 1877 are reported as 30,263. Everywhere, except on the islands of Hattea and Sundeep, the deaths from cholera appear to exceed those from drowning. On these islands the deaths from drowning are stated at 34,708, and from cholera at 7,133.

4. Terrible as these figures are, they represent an estimate of mortality far less than was at first apprehended. The total number of deaths from drowning in the districts of the Chittagong Division and in Backergunge is now stated to be about 100,000, whereas at first it was feared that the deaths amounted to double this number. No accurate census has been attempted. It was represented, and no doubt truly, by the district officers, that the people would feel a census at the present time, and so soon after such a terrible calamity had fallen on them, to be a hardship, and it is the case also that Government is not now in a position to obtain a fair census. The people have, many of them, temporarily left their homes; others are wandering about buying cattle to supply their losses, and the outbreak of epidemic disease had placed the local subordinate establishment in a state of disorganisation. Any attempt at a regular census has therefore been postponed. But the recent estimates have been made as carefully as circumstances would permit, and the Lieutenant-Governor cannot doubt that they furnish results which approximately indicate the extent of the calamity. The deaths from cholera, notwithstanding the unceasing exertions of the Medical Department, are appalling in numbers; but it is satisfactory to know that this disease, in an epidemic form at least, disappeared before the close of the cold weather.

By order of the Lieutenant-Governor of Bengal,

H. J. S. COTTON,

Junior Secretary to the Government of Bengal.

No. 899.

Copy forwarded to the Commissioner of the Chittagong Division for information.

No. 10. of 1877.

DESPATCH from the GOVERNMENT OF INDIA to the SECRETARY OF STATE, Department of Revenue, Agriculture, and Commerce, Meteorology.

MY LORD MARQUIS,

Simla, the 24th May 1877.

IN continuation of our Despatch No. 7, dated the 19th ultimo, we have the

From the Government of Bengal,
No. 1,319, dated the 5th May 1877,
and enclosures.

honour to forward for your Lordship's information a
copy of the papers noted in the margin, relative to the
recent cholera epidemic in the districts of Backergunge,

Noakholly, and Chittagong.

We have, &c.

(Signed)

LYTTON.

F. P. HAINES.

E. C. BAYLEY.

A. J. ARBUTHNOT.

A. CLARKE.

J. STRACHEY.

E. B. JOHNSON.

W. STOKES.

From the JUNIOR SECRETARY TO THE GOVERNMENT OF BENGAL to the SECRETARY TO THE GOVERNMENT OF INDIA, Department of Revenue, Agriculture, and Commerce.

SIR,

Calcutta, dated the 5th May 1877.

IN continuation of this office letter No. 900, dated 27th March 1877, I am

From the Commissioner of Dacca, dated 24th March 1877.
To ditto ditto, No. 949, dated 2nd April 1877.
From ditto of Chittagong, No. 75G, dated 27th April 1877.
To ditto ditto, No. 1308, dated 4th May 1877.

directed to submit herewith, for the information of his Excellency the Governor-General in Council, a copy of the papers noted on the

margin, regarding the recent epidemic of cholera in the Backergunge, Noakholly, and Chittagong districts.

I have, &c.

(Signed) H. J. S. COTTON,
Junior Secretary to the Government of Bengal.

From F. B. PEACOCK, Esq., Officiating Commissioner of the Dacca Division, to the OFFICIATING SECRETARY TO THE GOVERNMENT OF BENGAL.

Dated Dacca, the 24th March 1877.

IN accordance with orders contained in your letter No. 585, dated 23rd ultimo, I have now the honour to submit in original the accompanying reports from the Magistrate and Civil Surgeon of Backergunge on the recent severe outbreak of cholera in those parts of that district which suffered most from the effects of the cyclone and storm-waves of the 31st October last.

2. I do not think there is anything in the circumstances of the places affected by the late epidemic which would operate to exempt them from the occasional visitations of this disease, to which all parts of Eastern Bengal are liable. But, as the Magistrate remarks in his second paragraph, there can be no doubt that the late outbreak was aggravated and intensified, if not actually caused, by the state in which the people were living. It can hardly be a matter for surprise that cholera should rage among people living in an atmosphere so polluted as to be almost unbearable, especially when, in addition to this, they were insufficiently clad, indifferently housed, and badly fed. The only wonder, to my mind, is that the disease did not sooner make its appearance and was not much more destructive than it was.

3. It is of course impossible to give with anything like certainty the number of deaths that have occurred. The sub-divisional officers of Dukhin Shabazpore and Patuakhally estimate them at 10,088 and 1,788 respectively, while Dr. Cameron puts them down at about 8,000 in the former, and about 2,900 in the latter sub-division. Neither of these estimates can, in my opinion, be accepted as anything more than the merest approximation to correctness, though of the two, from the manner in which it was framed, I consider Dr. Cameron's the most reliable. Information derived from the native doctors would no doubt be correct enough so far as it went, but there must have been many deaths in outlying villages which were never heard of. As for the information derived from a number of unintelligent, panic-stricken chowkeedars, it is palpable that this must be unreliable and unsatisfactory to the last degree.

4. In addition to the figures above given, Dr. Cameron estimates that about 300 deaths occurred in the portion of thana Backergunge visited by the disease, and about 1,550 in thana Mendigunge, or a total in all of 12,750 deaths. I can only hope that these figures do not represent a smaller mortality than actually occurred.

5. As regards the treatment of the disease, Dr. Cameron's report shows that all possible endeavours were used to bring medical assistance as speedily and as close to the sufferers as possible. On receipt of the first intimation of the outbreak of the disease, the Surgeon-General was asked to send five native doctors, fully equipped with medicines, &c., to Burrisal, and subsequently, as the disease spread, a further requisition for 20 more native doctors was made. Both these requests were complied with by the Surgeon-General with the utmost promptitude. Dr. Tomes was, under the orders of Government, specially deputed to Burrisal, to take charge of the Civil Surgeon's duties at that place, so as to allow of Dr. Cameron giving the whole of his time and attention to the adoption of measures for the abatement of the disease, and to the supervision of the native doctors employed in various parts of the district. An Assistant Surgeon, Baboo Kali Dass Mookerjee, was also sent to Burrisal with the first

of the native doctors, and rendered useful service in Dukhin Shabazpore till the 5th February, when he was unfortunately drowned through his boat being upset in a storm as he was crossing the Megna to visit the adjacent island of Manpura.

6. Nor were our endeavours confined to the actual treatment of the disease itself. Both before and after the outbreak, everything that could be done was done to get the people to burn, to bury, or to dispose of in some way or other, the numerous bodies of men and carcases of cattle that were lying strewn about in all directions, to cleanse the tanks of the *débris* with which most of them were filled, and generally to take such steps as might prevent or, at least lessen, the chances of an outbreak. These endeavours were not relaxed, but were persevered into the end, notwithstanding the apathy displayed by the people themselves, and the little assistance rendered by the zemindars and others who should certainly have been more alive to the extent of the calamity than they were.

7. The disease has now happily almost disappeared, though a few places still require to be watched, principally in the thana of Mendigunge and of Burhamuddin in Dukhin Shabazpore. Ten native doctors have already been sent back to Calcutta, and the services of others will be dispensed with as soon as this can safely be done.

8. It is satisfactory to notice that, with one exception, the native doctors behaved fairly well. That they should take, or attempt to take, fees from the people was inevitable under the circumstances in which they were placed, but so long as they did not neglect those who could not pay, and were active and energetic in the discharge of their duties, I should not be disposed to take too severe notice of this, even if the fact could be proved.

9. On the whole, therefore, I trust what has been done will have the approval of his Honour the Lieutenant-Governor, and that he may be pleased to signify, either through me or through the Medical Department, his appreciation of the good service rendered by Dr. Cameron throughout the whole of the operations.

10. The return of the original papers when no longer required is requested.

No. 519, dated Burrisal, the 16th March 1877.

From E. J. BARTON, Esq., Officiating Magistrate of Backergunge, to the OFFICIATING COMMISSIONER OF THE DACCA DIVISION.

WITH reference to your No. 84 of the 2nd instant, I have the honour to send you herewith a copy of a report by Dr. Cameron, the late Civil Surgeon here, on the recent outbreak of Cholera in the wave-stricken tracts of this district.

2. Last cold weather there was an outbreak of cholera in these tracts, and this would seem to point to the existence there, independently of the storm-wave and its consequences of conditions capable of themselves of calling into activity this terrible disease. That the special calamities of this year greatly aggravated these conditions there can of course be no doubt.

3. It will be in your remembrance that when the Lieutenant-Governor was here, shortly after the cyclone of the 31st October, the probability of the occurrence of a cholera epidemic in the wave-stricken tracts was discussed, and it was resolved to have a number of native doctors in readiness to meet such a contingency. Cholera appeared in Noakhally shortly after the cyclone, but here for weeks there was no appearance of the disease in the wave-stricken tracts. The matter was often talked of by the Civil Surgeon and myself. The Civil Surgeon seemed to think that the two native doctors whom you sent from Dacca, and to whom he refers in the 2nd paragraph of his report, might be returned. I asked the Civil Surgeon to retain them, as I felt almost certain that cholera would come. He, however, did, I believe, return the men to you on the ground that there was nothing here for them to do.

4. In the sub-division of Dukhin Shabazpore cholera, as an epidemic, broke out early in December, in the extreme north, in the Gazipura outpost, and soon after in Dowlutkhan thana. It was not, however, till January that the disease assumed its great and alarming proportions. Two additional native doctors were sent in December to this sub-division and posted in charge of the affected villages. By the beginning of January the disease had travelled southwards and appeared in the Burhamuddin thana. Dr. Cameron's report will show that nine native doctors were at work in the cholera-stricken tracts in the month of January. There was no time lost during the visitation to utilize to the utmost all the means of relief that were at our disposal. It will be in your recollection that I went to Calcutta after the durbar in January, and one of the matters which took me there

was the supply of a greater number of native doctors for the cholera-stricken tracts. In the first ten days of January cholera raged throughout the sub-division ; the number of deaths was very large, and the people became everywhere disheartened. The disease, in its most virulent and destructive form, began to abate in Dukhin Shabazpore about the middle of January. The northern half of the sub-division, where the disease first appeared, recovered first, and by the end of January the epidemic had greatly decreased everywhere. The rains that followed in the beginning of February put a complete stop to it. At any rate, the epidemic ceased almost coincidentally with the copious rainfall which we had in the beginning of February.

5. The number of deaths from cholera in Dukhin Shabazpore cannot at present, and probably never will, be ascertained with correctness. The figures of mortality given by the sub-divisional officer differ somewhat from those given by Dr. Cameron, and are these :—

Police Stations.	November 1876.	December 1876.	January 1877.	February 1877.	Total.
Dowlutkhan and Bhola	36	627	3,294	248	4,205
Gazipura	60	437	929	68	1,494
Burhamuddin	12	239	1,862	461	2,574
Taltoli	—		430	80	510
Tozamuddin	—		944	361	1,305
Total	108	1,303	7,459	1,218	10,088

The chowkeedars, who are universally the most ignorant of men, might and probably did, report the same deaths several times over, and omit or forget to report other deaths. Those conversant with the inexactness, both of memory and thought, which is a characteristic of these utterly illiterate and unintelligent men, will admit that this certainly occurred. These figures are based on the reports made by the chowkeedars, and are probably wrong. The sub-divisional officer thinks that the mortality is heavier than what is represented here. But I do not agree with him. Dr. Cameron's estimate, being based on the more intelligent observations of the native doctors, whom we had studded all over the sub-division, is probably the more accurate.

6 These figures show that the epidemic in Dukhin Shabazpore travelled from north to south. In November the largest number of deaths reported was in Gazipura outpost, *i.e.*, in the extreme north of the sub-division. In December, too, the epidemic was severer in proportion to the population at Gazipura than at the more southern stations (Dowlutkhan and Bhola), for the number of deaths in the former was nearly three fourths of the number in the latter, though in extent Gazipura is scarcely half of Dowlutkhan and Baola. The number of deaths in the southern half of the sub-division had increased from 12 in November to 239 in December, but this number is not a fourth of the number for the northern half, and cholera therefore was still most severe in the north. In January the mortality attained its highest point everywhere, and it was severer in Dowlutkhan than in Gazipura, and severest in Burhamuddin, which is more to the south. The number of deaths in Burhamuddin was more than half that in Dowlutkhan, though the area of the former is scarcely half of the area of the latter. In February the number of deaths in the south was greater than that in the north, not only relatively to area, but absolutely.

7. Mr. Datta, the sub-divisional officer of Dukhin Shabazpore, gives the following opinion regarding the causes of the epidemic :—

“The causes of this outbreak are various. Cholera, in an epidemic form, raged here last winter, and gradually died out in the rainy season, when good drinking-water was available everywhere. On the close of the rainy season cholera appeared again, even before the 31st October, and there can be no doubt the storm-wave of that date has fearfully aggravated it in various ways. The stench proceeding from dead bodies and dead cattle everywhere and in every village in this sub-division was of itself sufficient to bring on a fearful outbreak. I have endeavoured as much as I could, by orders on the police, proclamations in hâts and villages, injunctions on the villagers, and by personally impressing the subject on influential people in every place I visited, to have the dead bodies buried and the ground cleared, and I am assured that something in this way has been done and is still being done.

“The storm-wave has brought in the outbreak in other ways too. Houses have been everywhere blown down and washed away, and people, who have built up temporary sheds, suffered from exposure in the cold season. The stored grain, which has been

recovered, as well as some portion of the new rice reaped, remained under water for many hours, and in some places for days, and were partly spoilt, and the consumption of this spoilt rice is another aggravating cause. The water in tanks in many places has been spoilt, and the use of this water tends to disease. Imperfect clothing, imperfect food, and imperfect shelter have in all probability added to the virulence of the disease."

8. In connexion with this, I beg to call prominent attention to the fact that the apathy and indolence of the people everywhere were conspicuous. Every means short of force were employed by the local officers to induce them to remove the carcasses. Mr. Harris was sent to the spot on the day when first I heard of the inundation of Dukhin Shabazpore, and he did all that was legally possible in trying to get the people to help themselves and clean their villages. The relief officers and the native doctors who were in the sub-division in the beginning of November did the same. But the people obstinately refused to help themselves. I sent all the mehters I could raise. It would have taken thousands of them to clean the wave-stricken tracts of the dead bodies of human beings and cattle, for a great tract of country (about 1,100 square miles) had been affected by the waves. In this district and the neighbouring districts there are very few mehters. Of these most are already employed, and a great many of them will not touch dead bodies. With the exception of one or two, none of the zemindars did anything. They did not even send their servants to incite the inhabitants to help themselves. Even if they had sent their servants, I doubt if they would have succeeded in rousing the people and forcing them to do something. Altogether this was as dis-heartening an episode as any that occurred in connexion with this great calamity.

9. Mr Datta thus reports regarding the present condition of the people:—

"The people are recovering themselves from the effects of the recent calamity—the wave-storm and the cholera. Although the crops were very seriously injured by the storm-waves, the people had their betelnuts and their saving of preceding years to fall back upon, and they are just at present disposing of large quantities of betelnuts and importing rice. Unlike what takes place in other years, there is no exportation of rice from this sub-division at present. On the contrary, boat-loads of rice are coming to the several large hâts in this sub-division from Hattia, Noakholly, Nalchitti, and other places. Cattle, too, are being imported to the cattle markets from Madaripore, Mendigunge, and other places, while vegetables come mostly from Naraingunge and Dacca. Calamities so severe would have, of a certainty, been followed by a scarcity in most other places in Bengal, but the peasantry here are so well to do that they have up to the present time been able to find themselves in all the necessities, and will probably be able to tide over till the next harvest. Their hâts are thronged with people and tolerably well supplied, only that rice is not exported as in other years, and they have everywhere put up new sheds or houses and resumed their accustomed industries; and all this has been done although the crops suffered fearfully by the two cyclones; and in many villages that I have seen the dhan has not been at all reaped from the fields, for there was little to reap. To be sure many people have been impoverished and are distressed, especially those who found employment in previous years in building up huts, excavating tanks, &c. These people find no employment this year, as ryots are building their own huts and cannot afford this year to dig tanks. Some relief, however, will be given to these people when Government works are undertaken, either from the Khas Mehal Improvement Funds or in the Road Cess Department. There is still greater distress in the extreme south in Bhuta, Lalmohan, Shombhupura, Golukpura, Dhali Gournagar, and Lakhi—places where the cyclone caused most dreadful loss in lives and property. The people of these parts will require assistance to recover themselves, and investigations are now being made regarding their necessities and circumstances."

10. The cholera epidemic in the sub-division of Patuakhali was not nearly so severe as in Dukhin Shabazpore. I give in the margin the figures of mortality which were supplied by the police. It is believed that they are only approximately correct. The figures for thana Golachipa are certainly wrong, and I think Dr. Cameron's estimate of 1,900 deaths there is probably nearer the truth. Dr. Cameron's report shows that we had no less than seven native doctors at one time in this thana. The figures for Mirzagunge are believed to be tolerably accurate. There the people suffered much less in the cyclone, and there was no storm-wave, and cholera did not rage in an epidemic form. The large figure shown for that thana is due to better registration. In Bowfal and Golachipa,

Name of thana.	Total mortality from cholera.
Bowfal	775
Golachipa	369
Mirzagunge	644
Total	1,788

which suffered most in the cyclone, cholera raged virulently from the latter end of December till the end of January. The village police became temporarily disorganized. Many of the chowkeedars are not alive, and the survivors during the epidemic were irregular in their attendance at the thanas. The result has been that the registration of vital statistics by the police was extremely unsatisfactory. Mr. Gupta, the sub-divisional officer of Patuakhali, visited several villages in Bowfal and Golachipa while the epidemic was raging, and also afterwards, and he is inclined to estimate the actual deaths in Golachipa to be quite three times what has been reported by the police, and in Bowfal twice.

11. The rainfall towards the end of January gave the first check everywhere to the disease. The cholera disappeared altogether in the sub-division of Patuakhali immediately after the heavy rainfall in the first week of February.

No. 144, dated Burrisal, the 14th March 1877.

From DR. L. CAMERON, Civil Surgeon of Backergunge, to the MAGISTRATE OF
BACKERGUNGE.

WITH reference to your endorsement No. 428 of 5th instant, forwarding Bengal Government letter No. 585, dated 23rd ultimo, I have the honour to report as follows regarding the outbreak of cholera following the cyclone and storm-waves of the 31st October and 1st November last.

2. Alarming reports of sickness were received from Dukhin Shabazpore, Golachipa, and Bowfal thanas on the 3rd November. Four temporarily entertained native doctors were immediately sent to these places with supplies of medicines and instructions to afford medical aid to the people. His Honour the Lieutenant-Governor visited Dowlutkhan and Bowfal on the 10th November, and expressed himself satisfied with the medical arrangements. The storm-wave had affected the whole of the thanas of Dowlutkhan and Burranuddi, and portions of those of Backergunge, Bowfal, and Golachipa. Consequent on the storm-wave, the sanitary condition of these parts was excessively bad. The country was dotted over with dead bodies of men and carcases of animals. Although the water of the storm-wave was fresh, the tanks were in all instances filled with *débris*, and in many polluted by dead bodies. Notwithstanding the exertions of the Magistrate, the Joint Magistrate of Patuakhali, and the District Superintendent of Police, the people were slow in taking steps even to clear their tanks and rebuild their houses. They could not be got to burn or bury the dead bodies. Valuable service was rendered in Dowlutkhan by Mr. Harris, the District Superintendent of Police. He remained on the spot about a month and caused all dead bodies in the vicinity to be buried or thrown into the khal, from whence they were floated out into the river. At Koralia, in Choto Basdia, the zemindars sent a staff of mehters, who rendered similar services. At these places the tanks were also cleared. Good result followed, for little or no cholera or other sickness occurred at these places. At all other places the dead bodies were allowed to putrefy where they lay; swarms of flies were generated, and the stench was so bad as to be almost unbearable. The houses of the people were all destroyed, and they had to subsist on new and damaged rice. Although much disease might have been expected to be caused by these conditions, as a matter of fact little disease occurred till the middle of December.

3. The four native doctors treated a considerable number of cases of bowel complaints, fractures, wounds, contused wounds, and a few of cholera. Towards the end of November, there being no further occasion for their services, they were recalled. There was so little disease at this time that the services of two native doctors sent from Dacca could not be utilised.

4. On the 11th December six native doctors reported their arrival from Calcutta. They had been ordered by the Surgeon-General to come here for special duty in the cholera affected tracts. Reports of the prevalence of cholera having been received from Dukhin Shabazpore, Perozepore, and Mirzagunge thanas, three of these native doctors were sent to those places.

5. Fresh reports continuing to be received, the remaining ones were shortly afterwards sent to Perozepore, Dowlutkhan, and Bowfal. On the 2nd of January, the police native doctor of Burrisal was deputed to Burranuddi, and on the following day a native doctor

entertained here was sent to Darial, in Backergunge. On the following days alarming accounts were received from Dukhin Shabazpore and Bowfal, the worst accounts coming from Gazipura, in the north of the island, and from Dowlutkhan and Burranuddi in the south. The two native doctors sent to Perozepore thana were at once withdrawn and sent to Dukhin Shabazpore, early in January. There were nine native doctors posted or proceeding to their destination, as follows :—

Backergunge thana	-	-	Darial	-	-	-	1
Bowfal thana	-	-	Bowfal	-	-	-	1
			Kalaia	-	-	-	1
			Taltoli	-	-	-	1
Dowlutkan	-	-	Gazipura	-	-	-	1
			Dowlutkhan	-	-	-	2
			Mongulsikdar hât	-	-	-	1
			Burranuddi	-	-	-	1

6. At this time (5th of January) very alarming accounts continued to be received of the number of seizures and deaths from cholera. Great alarm prevailed in storm-affected

This was an exaggeration.— tracts. Numbers of the trading classes, and such of the E. J. BARTON. cultivators as could afford the expense, were reported to be leaving for places outside the area of the storm-wave. At Burranuddi and Tosheenuddi it was reported that there was not enough of people left to bury the bodies of those dead from cholera.

7. The chowkeedar service was much disorganised. Many of the chowkeedars had been drowned by the cyclone, many had since died of cholera, and those who remained were very irregular in their attendance at the thana. Reliable information about many parts of storm-affected tracts could not be had. After indenting for a young surgeon, an assistant surgeon, and five additional native doctors, I proceeded to visit Dukhin Shabazpore Island and Bowfal thana, in order to ascertain their condition, and to determine what further help was necessary, and where native doctors might be posted to the best advantage.

8. Leaving Burrisal on the 7th of January, I reached Gazipura, in the north of Dukhin Shabazpore, on the 9th. The native doctor had been at work here from the 23rd of December. He had treated 316 cases of cholera in 11 villages. The sanitary condition of the villages was very bad. The tanks for drinking-water had only been cleaned; the others were still filled with *débris* as they were left by the storm-wave. The houses had not been re-erected on account of scarcity of labour and the excitement caused by the prevalence of cholera. Perwannas had been issued to zemindars to dispose of corpses and clear tanks, &c., but nothing had been done. Wherever corpses lay a bad smell was apparent; least where the body had been exposed and had become dry, and most where they remained under rubbish. Swarms of flies infested the country and settled down on everything; especially on eatables. Cholera had been severe and general from about the 20th of December to the 5th of January. After this date it rapidly declined, and dysentery, diarrhoea, and dyspepsia began to prevail.

As cholera was declining, the native doctor was ordered to leave simple medicines, with directions for use, with the police, and to go round all the villages in the north of the island for the purpose of treating cases of disease, but more especially for the purposes of getting the people to clear their tanks, so as to prevent further deterioration of the drinking-water, to dispose of dead bodies, and to re-erect their houses. Bhola, the new head-quarters of the sub-division, was then visited. With the exception of a village called Bapta, near Bhola, there was not much cholera in this vicinity. Medical help had been given from Bhola. Dowlutkhan was reached on the 11th. The loss of

It was here the destruction of life life must have been terrible all along the east coast. All by the storm-waves was greatest.— the villages on the banks of the Megna were deserted. E. J. BARTON.

In the villages further inland sometimes as few as five or six people were found. Near Dowlutkhan I counted in one place 27 bodies, all in a state of decomposition. In this vicinity cholera began to appear in the beginning of December, but did not become severe until the 20th. Subsequently to that date the number of deaths was alarming and caused great consternation amongst the people. The police reported 780 deaths in December. Two native doctors had been at work here, one from the 17th of December, and one from 7th of January. They had treated 822 cases in 69 villages. Some of the large villages, such as Nyamutpore, Betua, Bejoypore, Noldagu, Hazipore, Bukshemaji, &c., suffered most severely. The sanitary condition here was similar to that of Gazipura, as mentioned above. Dowlutkhan almost

escaped the disease. Cholera began to markedly decline from the 2nd of January. In consequence of this, one of the native doctors was removed to Tosheenuddi. At

The storm-waves here caused an exceptionally great destruction of life.—E. J. BARTON.

Tosheenuddi great alarm prevailed. Cholera was very severe in the large villages of Chandpore and Tosheenuddi. After the cyclone many of the dead bodies had been thrown into the khals, but much *débris* still encumbered the villages. Cholera prevailed in all villages in this outpost. At Ramprosad's hât and Dhali Gournagur, &c., in the south of Dukhin Shabazpore Island, similar conditions prevailed. Here a native doctor was at work. The south end of Dukhin Shabazpore Island was then rounded and the villages on the east coast visited as far as Taltoli, in Badura Island, on the east coast of Dukhin Shabazpore. Although cholera prevailed it was not severe.

9. The condition of Badura Island was found to be fair; there was little cholera but much dysentery and diarrhoea. A native doctor was at work here. At Burranuddi there had only been two deaths from cholera in December, but from the 1st to the 15th January, in 16 out of 90 villages 300 deaths occurred. Cholera declined here after the 15th.

10. At Bowfal, Kalaia, and Darial a similar state of matters prevailed. Cholera was rapidly declining. On arrival at Burrisal I found that Assistant-Surgeon Kali Dass Mookerjee and five native doctors had arrived. The assistant-surgeon was deputed to Dukhin Shabazpore for inspection duty. He was unfortunately drowned while proceeding to Manpura Island, by the upsetting of his boat in a storm on the 4th February. He was an intelligent and energetic officer, and had been of great assistance while employed in the island. The native doctors were disposed of as follows :—

One to Manpura Island.

One to Gorindar hât, for the tract of country between Mongulsikdar's hât and Tosheenuddi.

One to Dhonia Monia for the tract of country between Burranaddi and Bhola.

The remaining two native doctors were sent to Golachipa thana; one for the tract of country near Golachipa, and one for Basdia, Rangabali, and other islands and churs off the coast. On the 17th, before my arrival, a locally-entertained native doctor had been sent to Golachipa for the northern portion of the thana.

11. On the 19th of January there were 15 native doctors at work, as follows :—

Backergunge thana	-	-	Darial	-	-	1
Bowfal	"	-	Bowfal	-	-	1
			Mominpura	-	-	1
			Golachipa	-	-	1
Golachipa	"	-	Basdia	-	-	1
			Chiknikandi	-	-	1
			Burranuddi	-	-	1
Burranuddi	"	-	Badura	-	-	1
			Tosheenuddi	-	-	1
			Gorinda hât	-	-	1
Burhamuddin	"	-	Mongulsikdar's hât	-	-	1
			Manpura	-	-	1
			Dowlutkhan	-	-	1
Dowlutkhan	"	-	Dhonia Monia	-	-	1
			Gazipura	-	-	1

12. The sub-divisional native doctor of Bhola was available for the tract of country around. At this time, although cholera was declining, bowel-complaints were very prevalent, and it was not anticipated that the wave-stricken tracts would return to their normal state of health till after the beginning of the rains. With a view to the tracts being mapped out into circles, each in charge of a native doctor, 15 additional native doctors were asked for. Pending their arrival I proceeded to visit Golachipa thana. The sanitary condition of this was similar to that of Dukhin Shabazpore, but cholera had not been so prevalent or so fatal. Bowel-complaints also were less prevalent.

13. Six native doctors arrived from Calcutta on the 30th of January; they were disposed of as follows :—

One to Boro Basdia.		One to Alipore hât.
One to Boalia.		One to Selmabad.
One to Betagee hât.		One to Shastabad.

14. The disposition of the 21 native doctors stood as follows:—

Backergunge thana	-	-	-	Darial	-	-	1
Bowfal	„	-	-	Bowfal	-	-	1
				Mominpura	-	-	1
				Choto Basdia	-	-	1
				Boro	„	-	1
				Boalia	-	-	1
Golachipa	„	-	-	Alipore hât	-	-	1
				Betagee hât	-	-	1
				Nalkhola	-	-	1
				Chiknikandi	-	-	1
				Burranuddi	-	-	1
				Badura Island	-	-	1
				Native doctor with-			
				drawn to Mendi-			
Burranuddi	-	-	-	gunge.			
				Tosheenuddi	-	-	1
				Manpura Island	-	-	1
				Gorinda hât	-	-	1
				Mongulsikdar's hât	-	-	1
Dowlutkhan	-	-	-	Dowlutkhan	-	-	1
Burrisal	-	-	-	Dhonia Monia	-	-	1
				Shastabad	-	-	1
				Selimabad	-	-	1
Mendigunge	-	-	-	Daudpore	-	-	1
				Uttur Shabazpore	-	-	1

15. Eight native doctors arrived on the 13th February; they were disposed as follows:—

- One to Dowlutkhan, to relieve locally entertained native doctor.
- One to Nalkhola to ditto ditto.
- One to Darial to ditto ditto.
- One to Mendigunge thana.
- One to Dhulia in Backergunge.
- One to Police Hospital, Burrisal.
- One to Showluk in Gournuddi.
- One for duty in the Civil Surgeon's office.

Deducting three locally-entertained native doctors whose services are dispensed with, this left 26 native doctors on cholera duty in the district.

Mendigunge thana was visited in February and thoroughly gone over. There was little cholera, except in the south, around Selimabad.

On account of the improved state of health and the improved sanitary state of the wave-stricken tracts, 10 of these native doctors have now been sent back to Calcutta, leaving 16 still employed.

16. Cholera prevailed over the entire wave-stricken tracts from about the 15th of December to the 15th of January. After that date it gradually declined, bowel-complaints taking its place. These are not fatal diseases. Occasional cases of cholera only occur now, except at Selimabad in Mendigunge, Tosheenuddi, Guruprosad hât and Manpura Island in Burranuddi.

17. The real cause of the epidemic appears to have been deterioration of the drinking water by the dead bodies and vegetable *débris*, aggravated by the privations consequent on the cyclone and the bad smells.

18. The total number of deaths in Dukhin Shabazpore sub-division since 1st of November is estimated to amount to 4 per cent. on the original number of inhabitants, or about 8,000 deaths; in Golachipa to 2 per cent., or 1,900 deaths; in portion of Bowfal affected to 2 per cent., or 1,000 deaths; in the portion of Backergunge 300 deaths; and Mendigunge 1,550 deaths, in all 12,750 deaths.

19. Suggestions were made as occasion required for having dead bodies burnt in site, &c. The Sanitary Commissioner's memorandum was freely circulated among the people. In this instructions were given regarding filtering water, cleaning and improving tanks, &c. The native doctors were enjoined to explain its provisions to the people wherever they went. The sanitary condition of the tracts is now reported to be much

improved. The soft parts of the dead bodies are now completely decomposed, and they are harmless. A few native doctors may be required to remain at their posts till the rains set in; 10 or 12 may be enough for this purpose. When cholera ceases in the portions of Mendigunge and Burranuddi thanas, where it now still prevails, the number of the native doctors may be reduced to 10 or 12.

20. Surgeon Tomes, who was deputed to conduct the duties of the station during my absence, gave much assistance in compiling the weekly return of the native doctors and in forwarding them to proper authorities. The native doctors, with one exception, acquitted themselves fairly well. It is believed that in many instances they extorted fees from the people, but of this no sufficient proof is available to prove the charge against any native doctor in particular.

From the JUNIOR SECRETARY TO THE GOVERNMENT OF BENGAL to the COMMISSIONER OF THE DACCA DIVISION.

SIR, Calcutta, the 2nd April 1877.

I AM directed to acknowledge the receipt of your letter, without number, dated 24th March 1877, forwarding with your remarks a report from the Magistrate of Backergunge regarding the recent outbreak of cholera in that district.

2. The total mortality from cholera is estimated at 12,750 deaths. This is considerably less than has been reported from Noakholly, where, up to the 31st January, the deaths are stated at 30,263, and up to the end of February at 45,000. But a final official report from Noakholly has not yet been received.

3. The Lieutenant-Governor cordially acknowledges the exertions of both the civil and medical officers in Backergunge during the past very trying season. Assistant Surgeon Baboo Kali Das Mookerjee, who, it is stated, had done excellent service, was unfortunately drowned by the upsetting of his boat in the Megna River; and the Lieutenant-Governor has heard of his death with regret. Upon the whole, the extra native doctors behaved fairly well. The burden of the medical arrangements fell upon Dr. Cameron, the Civil Surgeon, and the Lieutenant-Governor has formed a very favourable opinion of the energy and judgment with which he directed, and himself shared in, the administration of relief. An expression of this opinion will be communicated to the Surgeon-General in the Indian Medical Department.

I have, &c.

(Signed) H. J. S. COTTON,
Junior Secretary to the Government of Bengal.

No. 950.

Copy of the correspondence forwarded to the Surgeon-General for information.

No. 951.

Copy of the correspondence forwarded to the Sanitary Commissioner for information.

No. 952

Copy, with copy of endorsements, forwarded to the Medical Department of this office for information.

By order of the Lieutenant-Governor of Bengal,
(Signed) H. J. S. COTTON,
Junior Secretary to the Government of Bengal.

No. 75 G, dated Chittagong, the 27th April 1877.

From E. E. LOWIS, Esq., Commissioner of the Chittagong Division, to the SECRETARY TO THE GOVERNMENT OF BENGAL, Financial Department.

WITH reference to your letter No. 585, dated the 23rd February last, I have the honour to submit the following report on the severe epidemic of cholera which has

occurred in my division. Statements showing the number of deaths that occurred up to 31st January 1877 have already been submitted with this office memorandum No. 662 G, dated 13th ultimo, and similar statements showing the number of deaths which have occurred during the whole period from effect of cholera in both the districts of my division are herein enclosed, showing at a glance the terrible results of this outbreak of sickness.

2. I beg also to submit sketch maps* showing the places where cholera prevailed in an epidemic form and caused great loss of life among the inhabitants, and also showing the localities at which the medical relief centres were formed.

3. Almost immediately after the cyclone of the 30th October cholera broke out in those places which had suffered the most from the storm-wave. In Chittagong cholera broke out immediately after the cyclone in Seetacoond and Coomirah, north of the station on the Dacca road. About the same time (7th November) cholera appeared at Bakolia and Changao, east of the station, in the town thana, and extended to the adjoining villages. On the 19th November it broke out in Moishkhali, Goshail Dengah, and Potengah, also in town thana; these places lie west of the station; these villages had also suffered much from the storm-wave, and on the 8th December the epidemic reached Kolagao, on the left bank of the Kurnafoolee, south of the sudder station, in Puttea thana, whence it extended by degrees to the adjoining villages. Kolagao had also been inundated by storm-wave. On the same date it appeared in Noapara and Raojan, where the storm-wave did not reach, though a small portion of the former was inundated by the overflowing of the river Kurnafoolee and its tributary the Halda; and on the 27th December it reached as far south as Banskhali, on the Sungoo River in Satkanea. It thus gradually extended through the whole sudder sub-division of the district and Kutubdea, though it first appeared and raged with greater virulence in places inundated by the storm-wave.

4. The available native doctors were at once sent out to Seetacoond and Bakolia, where cholera first appeared; but in other places no medical assistance could at first be rendered, except by the distribution of cholera pills, as there were no extra native doctors or good medicines available. Assistance was, however, promptly indented for, as well as stores of medicines, both of which were urgently required. These were sent with all possible despatch, but the epidemic spread over the district in so short a time that, although the extra doctors with medicines arrived as early as could be expected, the disease had made great head before their arrival.

Dr. Coates, the Sanitary Commissioner, arrived here in December, just when men and medicines were most wanted; and with his valuable aid a scheme was drawn up for utilizing to the utmost the agency at our disposal. Nor did Dr. Coates content himself with simply giving advice; he personally visited some of the worst localities, carrying medicines with him, which he distributed on the spot, and by his presence and advice did much to allay alarm and anxiety in the minds of the people. It was determined to post the native doctors at different central places, dividing the stricken tracts into circles; and to ensure that the native doctors were on the alert, sub-assistant surgeons were placed in immediate charge of all these circles, the whole being under the control of the civil surgeons, to whom the native doctors submitted regular returns showing number of patients, success of treatment, stock of medicine in hand, &c. By this means the civil surgeons were kept informed of what was going on, and could exercise control. The two assistant surgeons and nine native doctors supplied by Government for this district were thus disposed of; and at the same time educated and charitable villagers were supplied with medicines for distribution to the village people who lived at a distance from the medical centres; while rules for observance of sanitary measures were circulated as widely as possible to all the villages, especially where the epidemic prevailed. Some of the native gentlemen also in the town distributed medicines gratis; in short, the aid and sympathy of every one who could render any help were enlisted. The disease reached its climax about the end of December, when several European residents were attacked. Soon after this there was heavy rain, which checked the virulence of the disease to a certain extent. Cholera in Chittagong has abated since the heavy rains in February last, but it is yet to be found more or less throughout the district, as the disease appears to be epidemic in Chittagong. As I write, I learn from the magistrate that news has reached him of cholera having broken out in Cox's Bazar, and to the extreme south of the district, a part which had hitherto escaped; the disease appears to have been carried there by persons returning from Akyab, where, I believe, cholera is now raging.

* Not reprinted.

5. The district of Noakholly suffered even more severely than Chittagong, and in consequence cholera appeared in a virulent form, and spread at once over almost all parts of the district, as well as in the groups of thickly inhabited islands of Sundeeep, Hatea, Bamni, &c. &c. The disease first appeared where the salt water had penetrated, and this tract being more extensive than in Chittagong, it appeared in a greater number of places simultaneously, and spread more rapidly, causing at the same time greater devastation. As in Chittagong, the disease seems to have reached its climax in Noakholly in the end of December; and from persons who came to attend the durbar in the beginning of January I received most alarming accounts of the state of depression to which the people were reduced.

6. To prevent the spread of the disease much the same measures were taken as at Chittagong; in fact, a scheme practicable for both districts was concerted with Dr. Coates, and the instructions issued and suggestions made were identical for both districts. These instructions appear to have been admirably worked by Dr. Lyons, who appears to have been indefatigable in the discharge of his duties at this trying time. The following measures were as far as possible carried out by him :—

- 1st. Protection of drinking-water tank in station, and excavation of wells or tanks in large villages south-east and south-west of the district.
- 2nd. Burning and burying of corpses and carcasses, and, where not practicable, they were floated out with the tide.
- 3rd. People advised to make early applications for medicines, and to avoid exposure and fatigue.
- 4th. Police to see that the bodies of those who died from cholera were burnt or buried, and to advise relatives or friends of the cholera-stricken to destroy bedding, &c., and to bury as soon as possible all cholera evacuations.
- 5th. Burning of large fires to windward of affected villages.
- 6th. Fallen trees and branches in tanks and water-courses to be removed.
- 7th. Recommending people to be specially careful about drinking water, which should be boiled and allowed to cool before using.
- 8th. Attention to conservancy and burning of refuse heaps.
- 9th. Recommending that the people in the bazar (Shudharam) and neighbourhood should be required to clear up their latrines, or, if that was impracticable, that the exposed filth should be sufficiently covered with earth to render it inoffensive.
- 10th. Stagnant water in drains and watercourses to be baled out.
- 11th. Thatching grass fields in station to be cut down.
- 12th. That brickmaking operations carried on along some of the large drains in the station should be removed to outlets of drainage.
- 13th. Personal inspection by the civil surgeon of fish and other supplies in bazar on frequent occasions; and two fishmongers detected selling fish unfit for use were prosecuted.
- 14th. Forbidding the sinking of bodies in the khals.

7. Medical relief was afforded from the very outset of the epidemic (viz., from the 4th November 1876) at the charitable hospital, where, on the 8th November alone, as many as 114 persons applied for medicines for their friends; police thanas and outposts also were furnished with cholera medicine as fast as they could be prepared and sent out.

Native doctors and compounders were entertained, and on the 7th November one of the former engaged on the islands of Sundeeep was placed there for duty, and two of the latter were on the 9th of November sent to Ingadia and Chur Uria, while on the 11th November the sub-divisional native doctor proceeded to Faquir Hât. Meanwhile, further help had been called for, and, on the 12th November, two out of four native doctors telegraphed for arrived, and were sent to Hatiya and Sundeeep. On the 14th a compounder was despatched to Chaprassee Hât, and the remaining two native doctors telegraphed for on the 7th November, on their arrival on the 24th November, were sent to Farashgunge and Bamni. On the 27th and 29th two locally engaged native doctors were sent to Zorwargunge and Chagalnaya, and on the 30th November two more Government men arrived and were posted to Sundeeep and Nulchira in Hatea. On the 8th December two more arrived from Calcutta, and were despatched to Mirkaseraï and Sundeeep, and on the 11th December two more native doctors arrived, and were sent to Sundeeep. On 16th December two assistant surgeons arrived, and in pursuance of the plan proposed by Dr. Coates were placed, one in charge of the Mirkaseraï circle, and the other to Sundeeep in the first instance, but he afterwards directed to supervise Hatiya as well. In January I sent off a party of native doctors who had come by steamer, with instructions to proceed to Noakholly, and *en route* to report themselves to the Fenny sub-divisional officer, in case their services might be urgently required there. Of these, one assistant surgeon and a native doctor were detained by the officer

in charge of Fenny sub-division, and stationed—the former at Kazi Hât, and the latter at Bamni; the remainder reported themselves at Noakholly, and were posted on 23rd January—a sub-assistant surgeon to Bhulloah and four native doctors to Moonshee Hât, Moigdee, Chur Fakira, and Gungadas Moonshee's Hât. On the 7th February another native doctor arrived and was sent to Shantashita, to replace a locally entertained compounder who had fallen sick.

8. Supplies of cholera medicines were furnished to the District Superintendent of Police, to intelligent people of Luckhipore, Begumgunge, Shantashita, Shonadea, Dulal Bazar, and to many others who desired to be provided with them for distribution; the officers, both European and native, proceeding into the interior were also liberally supplied. Renewal of supplies on their requisitions were also made, and continued to be made, to native doctors and police thana officers.

9. The native doctors and compounders were given verbal and written instructions to explain to the people to be careful in their diet, drinking-water, and conservancy arrangements, &c.

10. One assistant surgeon was placed in inspecting charge of the islands, another of Mirkaserai or Eastern Division, a third of Bhulloah or Western Division, and the fourth was deputed to Kazir Hât by the sub-divisional officer. The sub-assistant surgeon, besides inspecting the work of the native doctors and seeing that the latter moved about their circles, were also provided with medicines and directed to treat cholera cases themselves.

11. According as the medical relieving officers arrived and could be entertained they were sent to the parts most needing their services, and when the disease abated in one place they were sent to another. The staff consisted of 4 assistant surgeons, 16 Government native doctors and 3 local, 3 Government compounders and 3 local; total 29. Besides this, for jail, police, and dispensary works there were two native doctors and one compounder.

12. All the native doctors have been withdrawn from the islands, and the assistant surgeon who was there left for Calcutta on the 23rd February, while the services of the locally engaged men have also been dispensed with. There now remain at Noakholly two assistant surgeons and eight native doctors, who are distributed as follows :—

One assistant surgeon at Bhulloah and the other at Kazir Hât, and a native doctor at Moigdee, Begumgunge, Dulal Bazar, Bammi, Mirkaserai, Boktar Moonshee's Hât, and two in a reserve in Noakholly.

13. The services of the extra establishment at Chittagong have been dispensed with, and any necessity for keeping up that at Noakholly will, I trust, soon disappear.

14. The primary cause of the disease was of course the cyclone and storm-wave.

Causes of disease; salt inundation. Wherever the salt water penetrated vegetation was killed and the drinking water spoiled, and there the cholera first began. In fact, Dr. Coates found the limits of the first outburst coincident with the extent to which the salt water penetrated. This was peculiarly marked along the Dacca road, the embankment of which saved the country to the east of it from inundation. Along that road every village to the west which had suffered from inundation was visited at once with cholera, while the villages on the other side of the road escaped

Poisoned atmosphere. at first. A poisoned state of atmosphere was added to bad drinking water, for the storm-wave swept away everything before it, and the whole sea-coast towards the north was strewn with the carcasses of cattle and human bodies. In other places also the khals, tanks, the sea-shore were full of carcasses and corpses. No vultures were to be seen at first, and the people, who have suffered a great shock from the cyclone, could not be persuaded to bury the dead bodies. The local authorities tried their best, with the small agency at their disposal, to bury or float away the carcasses, but long before it could be accomplished the atmosphere was tainted, and so great was the smell that travellers passing along the roads, especially along the Seetacoond road, kept their nostrils and mouth covered with their hands or dress; and the same state of things in an intensified form was to be found all over the islands forming part of the Noakholly district. Salt water, too, accumulated in innumerable ditches and other low places from which it was impossible to drain it, and this added to the evil.

15. The disease was further intensified by the use of bad food, the greater portion of the grain and other food upon which the people depended for their living having been destroyed or damaged. The people used the damaged grain for about a fortnight after drying it in the sun; large quantities of grain contaminated by salt water were also carried away from the town

by the people, who mobbed the merchant's godowns for the same, the police being unable to restrain them.

16. Bad water I have already alluded to as a cause of sickness. The water of almost

Use of bad water.

all the tanks on the sea coast was rendered either salt or brackish, while all vegetation in them was destroyed by the admission of salt water, and the accumulation of carcasses and débris in them made the water more impure than ever. The narrow strip of country, about 24 miles long and 4 miles wide, along the west of the Dacca trunk road, portion of the eastern bank of Kurnafoolee, Banskhali, and northern part of the Kutubdea, as well as the islands and coast of Noakholly, were submerged, and the people had no alternative but to use the water of those tanks. Where tanks were distant the people fared rather better, for, by digging small wells for themselves, they obtained, it is true, brackish water, but water that was less contaminated by decayed vegetable matter.

17. Thanks to the promptitude with which our indents for men and medicine were attended to, and thanks especially to the counsel and help of Dr. Coates, the late terrible outbreak of disease has been checked and successfully combatted. I do not mean to say that medical help was afforded to every sufferer, but it has been afforded to many, and the very fact of help being at hand did much to dispel anxiety and give the people courage and confidence. To Dr. Coates, as I have said, is due the organization of a scheme for affording medical aid and for utilising to the utmost the agency at our disposal, as well as for valuable professional suggestions and instructions; but the best devised scheme will break down if inefficiently administered; and it is due to the civil surgeons of Chittagong and Noakholly, Dr. Murray and Dr. Lyons, to state that, but for their personal exertions and the interest taken by them in the work, the disease would not have been as successfully dealt with as it has. The magistrates of the two districts afforded valuable help, but of course professionally they could do little. The sub-assistant surgeons and native doctors did well, with two unfortunate exceptions, viz., Sub-Assistant Surgeon Baboo Shibkisto Dass, who refused to go to Sundeeep when cholera there was at its worst, and a sub-assistant surgeon who deserted his duty at Mirkaserai. Both these cases have been separately reported. With these exceptions the other native doctors have done excellent service.

18. I have not been able to submit this report as soon as I hoped, for cholera has taken longer to abate than I expected; it was not till after 1st April that I could say it had almost entirely disappeared, and until I could report to that effect it seemed useless reviewing the success of the measures adopted for its suppression.

STATEMENT showing the DEATHS from CHOLERA in the districts of the CHITTAGONG DIVISION from 31st October 1876 to 31st March 1877.

1	2	3	4	5	6	7	8
Name of District.	Name of Thana and Outpost.	November 1876.	December 1876.	January 1877.	February 1877.	March 1877.	Total.
Chittagong	Town - - - -	529	615	550	149	20	1,863
	Hathazari - - -	35	228	337	133	32	765
	Futtickchery - -	49	260	383	161	27	880
	Seetacoond - - -	574	1,385	801	166	—	2,926
	Kumaria - - - -	255	487	422	209	—	1,373
	Raojan - - - - -	140	407	273	120	68	1,008
	Ramgania - - - -	7	39	67	10	6	129
	Pattia - - - - -	245	674	583	259	151	1,912
	Anwarah - - - -	43	319	375	193	60	990
	Parki - - - - -	80	484	503	26	—	1,093
	Satkania - - - -	6	89	60	55	38	248
	Jaldi - - - - -	118	171	159	116	63	627
	Banskhali - - - -	34	92	104	109	34	373
	Kutubdea - - - -	—	—	55	44	21	120
	Moishkhali - - -	—	9	34	4	—	47
	Cox's Bazar - - -	—	2	74	118	13	207
	Ramoo - - - - -	—	18	45	30	6	99
	Chakaria - - - -	—	4	43	32	4	83
	Doolahazara - - -	—	—	16	4	—	20
	Ukhia - - - - -	—	—	3	14	1	18
	Nhila - - - - -	—	—	—	4	—	4
	Teknaf - - - - -	—	—	3	—	—	3
Total of the district - - -		2,115	5,283	4,890	1,956	544	14,788

Statement showing the Deaths from Cholera in the Districts of the Chittagong Division,
from the 31st October 1876 to 31st March 1877—*continued*.

1	2	3	4	5	6	7	8
Name of District.	Name of Thana and Outpost.	November 1876.	December 1876.	January 1877.	February 1877.	March 1877.	Total.
Noakholly	Town - - - -	1,101	2,847	2,407	2,115	256	8,726
	Bamni - - - -	469	1,790	1,044	277	28	3,608
	Sundeeep - - - -	6,232	4,809	871	37	1	11,950
	Siddi - - - -	63	690	71	2	—	826
	Hatea - - - -	100	575	1,641	95	—	2,411
	Nulchira - - - -	30	229	188	6	—	453
	Lakhipore - - - -	196	169	907	355	278	1,905
	Roypore - - - -	37	87	385	115	45	569
	Farashgunge - - - -	452	369	889	389	73	2,172
	Ramgunge - - - -	51	79	186	87	123	526
	Begumgunge - - - -	41	162	511	788	953	2,455
	Fenny - - - -	513	2,940	1,590	1,632	396	7,071
	Chagulnaya - - - -	524	192	150	440	171	1,477
	Mirkaserai - - - -	711	475	589	165	—	1,940
	Zorwargunge - - - -	572	342	378	293	9	1,594
Total of the district of Noakholly - - - -		11,092	15,755	11,807	6,796	2,333	47,783
Total of the district of Chittagong - - - -		2,115	5,283	4,890	1,956	544	14,788
Grand total of the Division -		13,207	21,038	16,697	8,752	2,877	62,571

Chittagong Commissioner's Office,
27th April 1877.

E. E. Lowis, Commissioner.

FROM THE JUNIOR SECRETARY TO THE GOVERNMENT OF BENGAL TO THE COMMISSIONER OF THE
CHITTAGONG DIVISION.

SIR, Calcutta, 4th May 1877.
I AM directed to acknowledge the receipt of your letter No. 75 G., dated 27th April 1877, in which you submit a report on the epidemic of cholera that has recently occurred in your division.

2. The Lieutenant-Governor deeply deplores the terrible effects of this outbreak, which have resulted, it is believed, in a mortality unprecedented even in the annals of cholera. At the same time, it is satisfactory to be able to say that the exertions of all the officers of Government to alleviate the disease were unremitting. All possible assistance was afforded, and very great credit is due to both Dr. Murray and Dr. Lyons, the civil surgeons of Chittagong and Noakholly, for the zealous and indefatigable manner in which they devoted themselves to their professional duties during a most trying period. The especial acknowledgments of Government are also due to Dr. Coates, the Sanitary Commissioner, who was deputed to Chittagong in December, and who not only organised a scheme for affording medical relief and for utilising to the utmost the available agency, but himself personally visited the worst localities, lived among the people, and afforded them encouragement by his presence and advice. With two unfortunate exceptions, the native assistant surgeons and native doctors also did their duty well.

I have, &c.

(Signed) H. J. S. COTTON,
Junior Secretary to the Government of Bengal.

No. 1308½.

Copy of correspondence forwarded to Sanitary Commissioner for information and guidance.

No. 1308 $\frac{1}{2}$.

Copy of correspondence forwarded to Surgeon-General, Indian Medical Department, for information.

No. 1308 $\frac{3}{4}$.

Copy of this letter forwarded to Appointment Department of this office for information.

By order of the Lieutenant-Governor of Bengal,

(Signed)

H. J. S. COTTON,

Junior Secretary to the Government of Bengal.

DESPATCH from the SECRETARY OF STATE FOR INDIA to the GOVERNOR-GENERAL OF INDIA IN COUNCIL.

Geographical No. 1007.

MY LORD,

India Office, London, 2nd August 1877.

Para. 1. I have received the Despatches (noted in the margin)* of your Excellency's Government, forwarding papers on the subject of the cyclone and storm-wave which visited the districts of Noakholly, Backergunj, and Chittagong, on the morning of the 1st November last.

- * No. 75 (Public), dated 24th Nov. 1876.
- No. 1 (Meteorology), dated 24 Nov. 1876.
- No. 2 " " dated 1st Dec. 1876.
- No. 4 " " dated 8th Dec. 1877.
- No. 1 " " dated 12th Jan. 1877.
- No. 6 " " dated 12th Apr. 1877.

2. Although this calamity, as regards the immediate loss of life occasioned by it, is almost without a parallel in history, it is a matter of satisfaction to observe that the estimate at first formed of the number of deaths was considerably in excess of the reality.

3. On the other hand, it is distressing to see that the ravages of cholera, following close upon the track of the first-named disaster, have carried off no less than 75,000 lives. I gather from the present papers that the total mortality occasioned by the cyclone wave and the ensuing cholera amounted at the end of last March to about 165,000, or, say, 50,000 within the first rough estimate of the number of those who died by drowning alone.

4. The extraordinary, though not wholly unprecedented, inundation which was the immediate cause of the loss of life has, together with the physical cause and development of the cyclone itself, received very careful investigation at the hands of the Meteorological Reporter to the Government of Bengal. His exhaustive and lucid report shows that this great flood was due to an unusually high tidal wave, followed by the storm-wave of the advancing cyclone, both these phenomena being intensified by a violent north wind, succeeded immediately by south-west and west winds, an aggravation of conditions which combined to flood the whole of the low lands and islands about the estuary of the Megna to a depth of between 10 and 45 feet.

5. Both the storm and inundation appear to have been in some degree foreseen by the natives in Sundip and Hattiya, islands which suffered most severely from the same. It is much to be deplored, too, that very few took heed of the traditional warning conveyed by the "roaring sound" which is described as having been heard in the Bay to the south for two or three days previously.

6. The outbreak of cholera which forms the subject of two later Despatches* was a calamity, the evil effects of which were, as might be expected, proportioned to the magnitude of the preceding one. Although the civil and medical officers under the Government of Bengal appear to have devised most judicious measures for preventing the spread of the disease, it has not been possible everywhere to carry out these, owing in many places to the apathy and want of co-operation on the part of the natives. A notable exception is recorded in the case of some native gentlemen and villagers of Chittagong, who, I observe with pleasure, rendered most serviceable aid to the medical staff during the prevalence of the epidemic in the town.

7. By the 1st of April the strenuous efforts of the Bengal officers appear to have effectually stamped out the disease. I have much pleasure in expressing my concurrence with the Lieutenant-Governor in the sense he has expressed of the value of the energy and judgment shown by his civil and medical officers in their relief measures throughout the duration of this great calamity.

8. The possibility of providing safeguards against future loss of life by inundations, by the erection of mounds or by other measures, such as those alluded to in Sir Richard Temple's valuable Minute of the 21st November last, will I have no doubt occupy the serious attention of your Excellency's Government.

9. I request that 10 additional copies of Mr. Elliott's report may be forwarded to this Office.

I have, &c.
(Signed) SALISBURY.

Printed by GEORGE E. EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty,
For Her Majesty's Stationery Office.

LONDON:
Printed by GEORGE E. EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty.
For Her Majesty's Stationery Office.

RETURN to an Address of the Honourable The House of Commons,
dated, 13 April 1877 ;—for,

“ COPIES of all CORRESPONDENCE relating to the Case of Mr. *Fuller* and the
Case of Mr. *Leeds*.”

“ And, of the OPINIONS and DISSENTS of any of the Members of the Indian
Council.”

India Office,
17 April 1877. }

GEORGE HAMILTON,
Under Secretary of State.

(No. 37 of 1876.)

Government of India.—Home Department.—Judicial.

To the Most Honourable the Marquis of *Salisbury*, Her Majesty's Secretary of
State for India.

My Lord Marquis,

Simla, 12 October 1876.

WE have the honour to forward the correspondence noted in the margin*
with the Government of the North-Western Pro-
vinces and the High Court at Allahabad, on the
subject of the criminal trial of Mr. Fuller by the
Joint Magistrate of Agra, Mr. Leeds, in November
1875.

* Letter to the Government, North-Western Provinces,
No. 116, dated 20th January 1876.

Letter from the Government, North-Western Provinces,
No. 313A, dated 18th May 1876, and Enclosures.

Letter to the Government, North-Western Provinces,
No. 1098, dated 7th July 1876.

Letter from the Government, North-Western Provinces,
No. 610A, dated 15th August 1876, and Enclosure.

Letter from the Government North-Western Provinces,
No. 647A, dated 31st August 1876, and Enclosure.

2. Briefly stated, these are the facts on which
Mr. Fuller was tried. He had, on account of some
unpunctuality on the part of his syce, assaulted the
man by striking him on the head and face, and pulling him by the hair. Under
this assault (which Mr. Fuller alleges to have been committed with the open
hand, and not with the fist), the man fell down, then rose, ran into an adjoining
compound, and died almost immediately. A *post-mortem* examination proved
that the man had died from rupture of the spleen, for which, in the diseased
condition of that organ, the violence he had suffered was sufficient cause. For
this assault, Mr. Fuller was indicted by Mr. Leeds, under Section 323 of the
Indian Penal Code, on a charge of “causing hurt to his syce,” tried on that
charge, and sentenced to a fine of 30 rupees.

3. Certain notices in the vernacular press drew the attention of the Govern-
ment of India to the case, and on the 20th January last we requested the North-
Western Provinces Government to furnish us with information respecting the
alleged inadequacy of the sentence passed on Mr. Fuller. This information
was given by that Government, in its Letter, No. 313A, dated 18th May, and it
was fully reviewed in the Letter of this Government, No. 1098, dated 7th July.

4. From these two papers, your Lordship will perceive that the case had
apparently passed without notice from the Local Government previous to its
receipt of our communication. Thereupon, however, the Lieutenant Governor
called the attention of the High Court at Allahabad to the case, and obtained
from them an intimation that, though the sentence awarded by the Joint Magis-
trate was, in the opinion of the High Court, perhaps inadequate, yet that it did
not seem to the Court specially open to objection. The Lieutenant Governor, in

forwarding the Court's answer, stated that, in his Honour's own opinion, the case did not call for further action.

5. In that opinion we are unable to concur. It appears from Mr. Leeds' judgment that Mr. Fuller is an European British subject, and a magistrate of the rank of Mr. Leeds cannot inflict on an European British subject any sentence heavier than a fine of 1,000 rupees and three months' imprisonment; whereas the punishment allowed by law for the offence of simple hurt is a fine of 1,000 rupees and one year's imprisonment, to say nothing of that which may be awarded for the graver offences suggested by an illegal act resulting in death. We also thought that the occasion more especially called for the notice of superior authority, because the case was not an isolated case, but one of several in which very insufficient sentences had been passed for similar offences. It seemed to us that the course adopted by the Joint Magistrate was open to two serious objections. We believed, in the first place, that Mr. Leeds had shown a grave want of discretion in dealing with the case himself, and that he might and ought to have remitted to a superior tribunal the questions both of the legal degree of guilt attaching to the acts of the accused, and of the proper degree of punishment applicable thereto. We considered, in the first place, that, even supposing Mr. Leeds had acted rightly in dealing with the case himself, the penalty which he inflicted on the accused was scandalously inadequate, and, in fact, purely nominal.

6. We accordingly intimated our regret that the Government of the North-Western Provinces had allowed the case originally to pass without notice, and that the High Court had deemed their duties and responsibilities adequately discharged by such a mere expression of opinion as the case had called forth from them. We at the same time censured Mr. Leeds for his want of judgment and judicial capacity, and desired that he should not be employed in any higher office for at least a year.

7. We have since received, as will be seen, a letter from the High Court at Allahabad, and a Minute written by the Honourable Chief Justice, Sir Robert Stuart, which deal with our observations and orders, and raise certain objections of a legal or constitutional character, on which we will comment after dealing with some separate matters.

8. Apart from their legal objections, the Court observe that the case of *Regina v. Fuller* was never fully laid before them, and express regret that the Government of India, by challenging their view of the case before they had arrived at a matured and deliberate judgment on it, should have virtually censured the Court on an informal expression of opinion which they had no opportunity to explain or reconsider. Inasmuch, therefore, as the Court themselves imply that some more satisfactory result might have followed further reference to them, it must be regretted that the formal and precise character of the reply given by the Court to the inquiry of the Local Government left us no reason to suppose that it did not express their deliberate and final opinion, and, in fact, that opinion now appears to stand unchanged in all material points.

9. In their 8th paragraph, the Court, while they admit the authority of the Executive to censure or punish misconduct on the part of an officer of a subordinate Court, express an opinion that this authority would ordinarily be more fairly exercised after reference to the Court to which that officer is subordinate. We do not dispute this position; on the contrary, we have usually, on such occasions, sought the assistance of the High Courts, and gladly acknowledge the aid we have received from them. We may say, in fact, that such a reference is almost invariably our practice. Certainly, in the present case, we should have been very glad if the Court had seen their way to interpose by the exercise of either their judicial or their executive functions, that is, either by calling up the case, or by rebuking the Magistrate. If the Court had so acted we should have been relieved from the duty of reproofing the Magistrate ourselves. But, as before pointed out, we had every reason to believe that the Court, having had their attention called to the case, had declared an opinion which we were unable to accept.

10. In their 10th paragraph the Court express apprehension that our Resolution may impair their authority. We, however, are anxious that they should exercise their authority in such cases; and we think that our expression of regret

regret that they have not done so is calculated rather to strengthen than to weaken their hands whenever they put in action those functions of reproof and advice which are involved in their general duty of superintendence.

11. So far as their 15th paragraph is concerned, we concur in the general expediency of the course recommended by the Court, though there are some practical difficulties in the way of always adopting it. In the present instance it was quite within the competence of the Court to have required a more formal procedure. We are willing, however, that, as far as possible, the course which the Court indicate should be adopted in similar cases for the future, and will gladly avail ourselves of any suggestion from the Court for rendering that course more generally practicable.

12. By far the most important portion of the remonstrance addressed to us by the Court lies in paras. 2 to 10 of their letter; and inasmuch as we cannot resolve in the sense suggested and desired by the Court the questions raised in this part of their letter, though we do not conceive that we have in any way encroached on their authority or independence, we refer them to your Lordship in accordance with their wishes. Whilst so doing, we are glad to acknowledge the temperate and dispassionate manner in which the Court have stated their views concerning their relations to other parts of the Indian system of government.

13. The arguments on which the Court and Chief Justice rely, in claiming for the High Courts entire independence of the Executive, may be briefly stated as follows:

In establishing the old Supreme Courts of Judicature in the Presidency towns, the Crown, they say, delegated its inherent powers for the administration of justice to tribunals intended to be generally independent of the Executive in the discharge of their functions, and it was the intention of Parliament to invest the present High Courts with a similar independence. The Statutes under which these Courts were established declare that the Judges shall hold office during Her Majesty's pleasure, and only empower the Governor General in Council (or the Governor in Council, as the case may be) to receive their resignation, and make temporary appointments to vacancies on the Bench. The Courts were, by the Act, invested with such powers as the Crown might confer on them by Letters Patent, but, subject to these Letters Patent, and to the legislative action of the Governor General in Council, they were to possess the same powers as those of the Supreme and Sudder Courts which the Act abolished, as well as a general superintendence over the Courts subordinate to their appellate jurisdiction, although the rules made for this and other similar purposes were to be subject to the sanction of the Governor General in Council. The Letters Patent, moreover, only declare that the Courts should obey the requisition of the Government for such records, returns, and statements as the Government may require.

14. On these grounds, the Court question the right of the Governor General in Council to approve or condemn their action in any matter within the jurisdiction of the Court. The Court's letter also suggests that, in giving to the High Courts power and authority to administer justice and exercise superintendence over the subordinate tribunals, it was the intention of Parliament to exclude the Executive Government altogether from any share in such functions.

15. The Chief Justice carries his conclusions further. He contends that the Supreme Courts, in the exercise of their official and judicial powers, were amenable to no authority but that of the King in Council, and to this only in respect of judgments, decrees, and orders appealed from; that the power of the Supreme Courts, limited only by the Letters Patent, has descended intact to the High Courts; and that no authority anywhere exists competent to review the action of the High Courts except in those cases in which appeals are preferred to the Privy Council from their decrees. The Chief Justice also goes on to compare the relations existing in India and in England respectively between the judiciary and the executive.

16. We do not think it necessary to follow the learned Chief Justice into his comparison of Indian with English arrangements, nor to inquire how far the

various ranks of the Magistracy in England may be subjected to comment or correction from Her Majesty's Executive Government, or from the Houses of Parliament which influence the Executive. We have simply to inquire whether, Indian arrangements being what they are, it is beyond the province of the Governor General in Council to reprimand or to punish an Indian Magistrate whom he considers to have erred in the discharge of his duty, or to remark on what he believes to be the shortcoming of a High Court.

17. For the same reason, we do not enter upon any inquiry how far the High Courts stand in the position of the Supreme Courts, and how far in that of the Sudder Courts, nor stop to point out the extremely limited jurisdiction of the Supreme Courts. The High Courts Act established machinery compounded of various pre-existing elements and some new ones, but forming a new and different whole, and the question what part it plays in our system should, we conceive, be decided on other grounds than those of inheritance or tradition.

18. By Act of Parliament the Governor General in Council is charged with the "superintendence, direction, and control of the whole Civil and Military Government" of British India, subject in turn to the control of the Secretary of State in Council. The Governor General in Council is, therefore, the only authority in British India invested with the entire responsibility of every department and function of Government. There can be no question that the administration of justice is one of the most important functions of Government. Misbehaviour in the charge of judicial functions, from whatever cause proceeding, brings the administration of justice into contempt, and nothing is more calculated to derange the social order which it is the especial duty of the Government to preserve.

19. Each of the High Courts in India is invested with some important executive functions within its own province. The High Courts Act gives to them the superintendence over all subordinate Courts; with power to call for returns, and, subject to the control of Government, to make rules for practice, besides performing other acts of supervision. They have also been invested by Acts of the Indian Legislature with divers controlling powers, and, in the case of some minor Civil Judges, with powers of punishment. They are, therefore, an important portion of the executive administration of the country.

20. We are quite unable to find in the High Courts Act, or in any Charter, an intention to substitute the High Court for the Government of India in that portion of the administration which consists of reviewing or controlling the acts of the magistracy. There is no power there given to them of appointing, promoting, removing, suspending, or in any way punishing (except that reproof may follow upon superintendence) any subordinate Magistrate whatever. It can hardly be supposed that the Legislature meant to leave the whole power of reward and punishment in the hands of one authority, and the whole power of commendation, reproof, and advice in the hands of another.

21. We are equally unable to see how, in the Acts or Charters relating to the High Courts, anything can be found to show that their executive action enjoys immunity from comment, whether by the Governor General in Council, as contended by the Court, or by all other authorities, as contended by the Chief Justice. If it were so, there might be any degree of supineness on the part of a High Court, or refusal to use the powers committed to them, and yet not a word could be said, according to one view, by the authority responsible for the whole Civil Government of India, and, according to the other view, by any authority at all. With regard to the language of the High Courts Act respecting the appointment of Judges, on which the Court seem disposed to lay stress, we should rather say that, if it has any bearing at all on the present question, it would, when read by the light of the history of the English judicature, lead to a conclusion very different from that drawn by the High Court.

22. Unless, therefore, we are otherwise instructed by your Lordship in Council, we shall continue to act on the principle that it is our duty in the ultimate resort, and in adequate cases, to censure and to punish flagrant miscarriages of justice, and to comment, when necessary, on the course of the administration of justice in India. We are sensible of the delicacy of this power,

power, and we feel assured that the Government of India will never use it wantonly or indiscreetly.

23. We have dealt with the subject in its broadest aspect, because we think that the question is distinctly so raised by the letter and minute under review. But the Court, as distinguished from the Chief Justice, do not press to its full extent the principle on which they rely. Seeing that the power of reward and punishment resides with the Executive alone, they draw a distinction between the present case and other cases which they do not specify; and they suggest (in their paragraph 8) that, though the Government of India may interfere sometimes, it is not right for anybody but themselves "to instruct the subordinate Courts touching the conduct of their judicial duties," and that the Government of India should avoid any declaration "as to the law which should have been administered, or procedure which should have been adopted, in a particular instance."

24. Upon that distinction we have to observe that, in the present instance, we have carefully guarded ourselves from expressing any opinion on the substantive law of the case; that is to say, we have expressed no opinion as to what was the legal nature of the offence of which Mr. Fuller should have been found guilty upon the evidence ultimately received by the Court. The learned Judges have bestowed some attention on that question, but we do not consider it relevant to the discussion.

25. The overt and undisputed facts of the case are that Mr. Fuller committed an act of illegal violence, and that it caused death. Between those two facts is comprehended a whole series of offences ranging from simple hurt to wilful murder. Such an act, with such a result, may amount to either of those crimes, or to culpable homicide, grievous hurt, or rashness causing death. The degree of criminality depends on the intention.

26. Now there may be cases of offences triable either by a Magistrate or the Court of Sessions, according to the magnitude of the crime involved, in which the intention is so clear, and the lighter character of the offence so palpable, that a Magistrate may properly take them as established on preliminary inquiry, and deal with the case himself. But in cases of homicide this is rarely proper. The question of intention is usually one of nicety, and not so plain as to be decided on a preliminary inquiry.

In the present case there was some evidence given at the trial which, if believed (the Joint Magistrate did not believe it, and we have assumed that he was right), would have given to Mr. Fuller's offence a much graver complexion than Mr. Leeds considered it to possess, and we think that both the evidence and the legal definition of the offence ought to have been left to the judgment of the higher Court. Moreover, the act of illegal violence committed by Mr. Fuller belonged to a class of offences which ought, for obvious political reasons, to receive the fullest, the most public, and the most authoritative examination, whenever they occur, by a tribunal competent to inflict upon any offender, whatever his nationality, such sentence as may be found to be appropriate.

27. We, therefore, censured Mr. Leeds, not for an error in law, but for an error in conduct. We consider that the Joint Magistrate having, for the trial of this case, an option between two tribunals, evinced a culpable want of discretion in selecting that one before which evidence either of the graver class of crime, or of an aggravated instance of the lighter class, would be useless for want of jurisdiction. We consider further that this primary error was seriously augmented by the passing of a sentence which, if regarded only in reference to the evidence received and the indictment framed by the Joint Magistrate, was still so inadequate as to constitute a mockery of justice.

28. If we are right Mr. Leeds has been justly censured, and we are not to be debarred from censuring him because his faulty act was a judicial act. The position taken by the Court would shut us out from noticing all judicial acts, however corrupt, however arbitrary, however perverse, however calculated to bring obloquy on our administration. Such a position cannot, as we conceive, be maintained.

29. It is true that the Court seem to suggest, in their 17th and 18th paragraphs,

graphs, that the circumstances of the case were such as, under the 196th Section of the Code of Criminal Procedure, left no discretion whatever to the Magistrate, and that he was bound to try the case himself on the lightest charge consistent with the undisputed facts. We have, however, much difficulty in ascertaining the precise meaning of the Court, for in their paragraph 18 they apply the reasoning of paragraph 17 to the facts actually disclosed by credible evidence; whereas the question is, what facts appeared on preliminary inquiry, and what facts should have been taken, when such grave results had happened, as fairly likely to be disclosed before a competent tribunal. To the principles expressed in paragraph 17 we take no exception. The action of the Magistrate is to depend, according to those principles, on his being satisfied, and on his own opinion. But a man may be satisfied on reasonable or unreasonable grounds, and may form his opinion with or without care and judgment. A certain degree of irrationality or carelessness is visitable with censure, and we think that such a case occurred here.

30. If, indeed, we thought that the law compelled a Magistrate on preliminary inquiry to ascertain precisely the legal character of the offence, we should at once propose to alter the rule of procedure, for the result would be to confine to the lower and least experienced Court the decision on all delicate questions of law and evidence, and to refer to the superior and more experienced Court, which moreover alone has the assistance of a jury or assessors, only those cases in which there could be little or no possible question either of law or of fact, and every such case would thus be twice fully investigated, once by the Magistrate and once by the Judge. We feel assured that the intention of the framers of the Code of Criminal Procedure was very different from that involved in this view, and that the clause in question is calculated merely to assist the discretion of the Magistrate, and to indicate the point to which he is bound to carry his investigation before relegating a case to the Sessions Court for complete trial.

31. With reference to the case mentioned by the High Court in paragraph 9 of their letter, and again by the Chief Justice, we have only to remark that this case had nothing to do with the misconduct of a Judge, and has no bearing on the present question.

32. Your Lordship will observe that both the High Court, the Chief Justice, and the Lieutenant Governor unite in recommending that our order suspending Mr. Leeds from the exercise of his magisterial functions may now be withdrawn, in consideration of that officer's general character for ability and diligence. We are glad to receive testimony so favourable to Mr. Leeds. But our order was not passed on any consideration of his general character. It was passed with exclusive reference to what we considered to have been a flagrant miscarriage of justice in this particular case. The facts on which that opinion was founded remain unchanged. If the order we passed upon them was at any time a just one, its justice cannot now be impugned; and we are of opinion that the revocation or reversal of it would destroy the good it was intended to effect.

33. In conclusion, we observe that the High Court seem somewhat out of order in addressing their letter (though it was forwarded to us through the Government of the North-Western Provinces) direct to the Government of India instead of to the Local Government. But the subject matter of the correspondence is so important that we do not consider it right to delay the transmission of it to your Lordship in Council for the rectification of a mere error in form.

We have, &c.

(signed)

Lytton.

H. W. Norman.

Arthur Hobhouse.

E. C. Bayley.

W. Muir.

Alexr. J. Arbuthnot

A. W. Greene.

No. 116, dated Fort William, 20 January 1876.

From *Arthur Howell*, Esq., Officiating Secretary to the Government of India, Home Department, to the Secretary to the Government of the North-Western Provinces.

WITH reference to the first entry in page 632 of the Selections from the Vernacular Newspapers published in the Upper Provinces between the 10th and 15th ultimo, I am directed to inquire whether there is any foundation for the statement that a Mr. Fuller, a pleader at Agra, killed a syce and was fined 30 rupees for the offence. If the case has been in any way before the North-Western Provinces Government, the Governor General in Council would be glad to see a copy of the final orders passed on it.

No. 313 A., dated Naini Tal, 18 May 1876.

From *B. W. Colvin*, Esq., Officiating Secretary to Government, North-Western Provinces, to the Officiating Secretary to the Government of India, Home Department.

IN reply to your letter, No. 116, dated 20th January last, I am directed to say that the first extract on page 632 of the Selections from Vernacular Newspapers of the 20th December 1875, regarding an assault committed by a Mr. Fuller, of Agra, upon his syce, resulting in the death of the latter, for which Mr. Fuller was fined 30 rupees, is founded on fact.

2. The case has not been directly before the Local Government, but the opinion of the High Court of these Provinces has been taken respecting the adequacy of the sentence. I am to forward a copy* of that opinion and of the judgment of the Joint Magistrate of Agra, Mr. R. J. Leeds, upon which it was based, and to say that, as the High Court do not think the sentence especially open to objection, no further action appears to the Lieutenant Governor to be necessary.

* No. 1338, dated 27 April last.

No. 1338, dated Allahabad, 27 April 1876.

From *W. Tyrrell*, Esq., Registrar, High Court of Judicature, North-Western Provinces, to the Officiating Secretary to the Government of the North-Western Provinces.

I AM directed to acknowledge the receipt of the demi-official letter from your office, dated the 31st ultimo, forwarding the record of the case indicated in the margin, and requesting an expression of the Court's opinion as to the propriety of the sentence passed upon the accused.

Regina v. Fuller.
Charged under section 323, Indian Penal Code, and sentenced to pay a fine of 30 rupees by the Joint Magistrate of Agra.

2. In reply, I am desired to observe that the Joint Magistrate considered the evidence given by Saikoo, coachman, to be the most reliable. According to his statement, the accused was annoyed because the deceased, a syce, did not attend when his carriage was brought round to the door; he sent for him, struck him twice with his open hand, and seized him by the hair of his head, whereupon the deceased fell.

The medical evidence shows that the spleen was in a diseased condition, that death was caused by the rupture of the spleen, that this injury might have been caused by moderate violence or by a fall, and that there were no external marks of injury on the body.

3. Under these circumstances it appears that no great violence was used, and that the accused neither contemplated nor could have foreseen that severe hurt would have resulted from the degree of violence exerted by him, much less that it should have been followed by the lamentable result of death.

4. On these facts, as found by the Joint Magistrate, the sentence, though perhaps lighter than the Court would have been disposed to inflict under the circumstances, does not appear to be especially open to objection.

5. The record of the case received from your office is herewith returned.

Government v. R. A. Fuller.

THE accused is charged under Section 523, Indian Penal Code, with causing hurt to one Katwaroo, his syce. It appears that, on the morning of 31st October last, the accused and his family were about to proceed to church, and that the accused, annoyed at the non-attendance of the syce, sent for him, struck him with his open hand on the head and face, and pulled his hair, causing him to fall. The syce immediately got up and ran across the road into the adjoining compound, where he fell in front of the kitchen, and died shortly after.

In the meanwhile the accused and his family drove on to the cathedral, whence they were summoned by a neighbour, who informed them of what had happened. The medical evidence shows clearly that Katwaroo, the deceased, died from rupture of the spleen, which was much enlarged, and that very slight violence, either from a blow or a fall, would be sufficient to cause the injury.

Three out of the four eye-witnesses declare that the deceased was kicked in the stomach, but I see no ground for believing the statement. In the first place, the coachman, Saikoo, who was the only one of the witnesses in a position to see well what passed, makes no mention of the kicking.

2ndly. The accused himself, who at once reported the occurrence to the Magistrate, and made a detailed statement before me within two hours of the event, emphatically denies having kicked the deceased.

3rdly. There were no external marks of injury whatever, and it is on evidence that the rupture of the spleen which caused Katwaroo's death may have resulted from very slight violence, either in the shape of a blow or a fall.

4thly. The three grass-cuts were, by their own showing, at some distance and in positions which make it doubtful whether they really saw what passed.

5thly. The grass-cuts are more or less prejudiced witnesses from their relationship and connection with the deceased.

6thly. It is *prima facie* improbable that a European would kick his servant in the stomach. On these grounds I decline to accept a statement which, if true, would greatly aggravate the character of the offence, and render a committal necessary.

The coachman, who was close by when the assault took place, appears to have given a very fair account of what passed; and accepting the facts deposed to by him, it does not seem to me that the offence was other than one of causing hurt, as defined in Sections 319 and 321, Indian Penal Code.

I have accordingly framed a charge under Section 323, to which the accused pleads guilty. Before the charge had been drawn up, Mr. Beddy, for the accused, contended,—

1st. That no offence had been committed, as the law authorized a master to inflict moderate chastisement on his servant.

2nd. That no offence had been committed, as there was an implied contract on the part of the deceased as a servant to submit to such moderate chastisement.

On these objections being overruled, and the accused formally charged, Mr. Beddy urged in extenuation,—

1st. That the hurt voluntarily caused was slight.

2nd. That it was inflicted by way of correction.

3rd. That it was inflicted under provocation.

4th. That the offence was a compoundable one.

Taking

Taking all the circumstances fully and fairly into consideration, I am of opinion that the accused is guilty of voluntarily causing what distinctly amounts to hurt, in the ordinary as well as the technical sense of that word, and thus the illegality of his conduct must be marked by a fine which shall be something more than nominal.

I accordingly find Robert Augustus Fuller guilty of voluntarily causing hurt to one Katwaroo, an offence punishable under Section 323, Indian Penal Code, and sentence him to pay a fine of 30 rupees, or in default to undergo 15 days' simple imprisonment.

Under Section 308, Act X. of 1872, I direct that the amount of the fine be paid to the widow of the deceased.

R. J. Leeds,

Joint Magistrate and Justice of the Peace.

Agra, 6 November 1875.

(No. 1098.)

Home Department, Judicial.

From *Arthur Howell*, Esq., Officiating Secretary to the Government of India, to the Secretary of the Government of the North-Western Provinces.

Simla, 7 July 1876.

I AM directed to acknowledge your Letter, No. 313, dated the 18th May last, forwarding, at the request of the Government of India, copy of the judgment of Mr. Leeds, Joint Magistrate of Agra, in the case of *The Crown versus R. A. Fuller*, together with a letter from the High Court of the North-Western Provinces, expressing the Court's opinion on the sentence inflicted on Mr. Fuller by the Joint Magistrate.

2. The facts of the case are as follows: One Sunday morning, Mr. Fuller, an English pleader at Agra, was about to drive to church with his family. When the carriage was brought to the door, the syce failed to be in attendance, but made his appearance when sent for. For this cause Mr. Fuller struck the syce with his open hand on the head and face, and pulled him by the hair, so as to cause him to fall down. Mr. Fuller and his family drove on to church; the syce got up, went into an adjoining compound, and there died almost immediately.

3. The Joint Magistrate of Agra, before whom Mr. Fuller was placed to take his trial, framed the indictment, under Section 323 of the Indian Penal Code, for "causing hurt to one Katwaroo, his syce;" and it appeared, from the evidence of the medical officer who had conducted the *post-mortem* examination, that the man had died from rupture of the spleen, which very slight violence, either from a blow or a fall, would be sufficient to cause, in consequence of the morbid enlargement of that organ. The evidence in the case does not show any other assault; at least, the Joint Magistrate disbelieved (apparently on good grounds) all that portion of the evidence which referred to any other assault. The Joint Magistrate found Mr. Fuller guilty of "voluntarily causing what distinctly amounts to hurt," and sentenced him to pay a fine of 30 rupees, or, in default, to undergo 15 days' simple imprisonment; directing the amount of the fine to be made over to the widow of the deceased. At the request of the Local Government, the High Court expressed an opinion on the case, which was to the effect that the sentence, though perhaps lighter than the High Court would have been disposed to inflict under the circumstances, was not especially open to objection.

4. The Governor General in Council cannot but regret that the High Court should have considered that its duties and responsibilities in this matter were adequately fulfilled by the expression of such an opinion. He also regrets that

the Local Government should have made no inquiry, until directed to do so by the Government of India, into the circumstances of a case so injurious to the honour of British rule, and so damaging to the reputation of British justice in this country.

5. The Governor General in Council cannot doubt that the death of Katwaroo was the direct result of the violence used towards him by Mr. Fuller. He observes that the High Court assumes the connection between the two events as being clear. Yet, on reading Mr. Leeds' judgment, he does not find that that gentleman ever considered the effect or even the existence of this connection. Mr. Leeds did, indeed, consider whether Mr. Fuller ought not to be subjected to a more serious charge, but only because there was evidence given of further violence used by him, which evidence Mr. Leeds rejected, on grounds which are here assumed to have been sufficient. He seems, however, to have viewed an assault resulting in the death of the injured man in just the same light as if it had been attended by no such result.

6. The class of misconduct out of which this crime has arisen is believed to be dying out; but the Governor General in Council would take this opportunity of expressing his abhorrence of the practice, instances of which occasionally come to light, of European masters treating their native servants in a manner in which they would not treat men of their own race. This practice is all the more cowardly, because those who are least able to retaliate injury or insult have the strongest claim upon the forbearance and protection of their employers. But, bad as it is from every point of view, it is made worse by the fact, known to all residents in India, that Asiatics are subject to internal disease which often renders fatal to life even a slight external shock. The Governor General in Council considers that the habit of resorting to blows on every trifling provocation should be visited by adequate legal penalties, and that those who indulge in it should reflect that they may be put in jeopardy for a serious crime.

7. The Governor General in Council cannot say whether Mr. Fuller would have been convicted of a more serious offence, such as that of causing grievous hurt, or that of culpable homicide, had he been charged with it. But this he can say with confidence, that, in consequence of Mr. Fuller's illegal violence, his servant died, and that it was the plain duty of the Magistrate to have sent Mr. Fuller to trial for the more serious offence, a course which would not have prevented him from being punished (indeed he could thus have been more adequately punished) for the lesser offence, if that alone had been proved.

8. But, besides his error of judgment in trying this case himself, the Governor General in Council thinks that Mr. Leeds has evinced a most inadequate sense of the magnitude of the offence of which Mr. Fuller was found guilty. The offence was that of "voluntarily causing hurt." That is an offence which varies infinitely in degree, from one which is little more than nominal, to one which is so great that the Penal Code assigns to it the heavy punishment of imprisonment for a year and a fine of 1,000 rupees. The amount of hurt and the amount of provocation are material elements in determining the sentence for such an offence. In Mr. Fuller's case, while the provocation was exceedingly small, the hurt was death. For this, Mr. Leeds, while saying that he intends to inflict a punishment something more than nominal, inflicts only a fine of 30 rupees. The Governor General in Council considers that, with reference either to the public interests, or to the compensation due to Katwaroo's family from a person in Mr. Fuller's position (and it does not appear from the papers that Mr. Fuller has made any other compensation), such a sentence is wholly insufficient. He considers that Mr. Leeds has treated the offence as a merely nominal one, and has inflicted a merely nominal punishment; and that to treat such offences with practical impunity is a very bad example, and likely rather to encourage than repress them.

9. For these reasons, the Governor General in Council views Mr. Leeds' conduct in this case with grave dissatisfaction. He should be so informed, and should be severely reprimanded for his great want of judgment and judicial capacity. In the opinion of the Governor General in Council, Mr. Leeds should not be entrusted, even temporarily, with the independent charge of a district,
until

until he has given proof of better judgment, and a more correct appreciation of the duties and responsibilities of magisterial officers, for at least a year.

I have, &c.

(signed) *Arthur Howell*,

Officiating Secretary to the Government of India.

No. 610 A, dated Naini Tal, 15 August 1876.

From *B. W. Colvin*, Esq., Officiating Secretary to the Government of the North-Western Provinces to the Officiating Secretary to the Government of India, Home Department.

With reference to your letter, No. 1098, dated 7th July last, I am directed to forward the enclosed letter,* addressed by the High Court of Judicature, North-Western Provinces, to the Government of India, regarding the case of *Regina versus Fuller*. * No. 2431, dated 5 August 1876.

2. With advertence to its paragraph 35, I am desired by the Officiating Lieutenant Governor to say that he has reason to believe that the favourable opinion of Mr. Leeds' general character and qualifications which is expressed by the High Court was also held by his predecessor.

3. Mr. Leeds has already during the present month been once passed over for the charge of a district, in compliance with the instructions conveyed in your letter under reply.

In view of this, and of the recommendation in his behalf which has been submitted by the High Court, Sir George Couper would be glad if his Excellency the Governor General in Council should see fit to reconsider the orders which have been passed regarding him, and to relieve him of the disqualification which, at present, operates as a bar to his promotion for the next year to come.

(No. 2431 of 1876.)

From *William Tyrrell*, Esq., Registrar, High Court, North-Western Provinces, to *Arthur Howell*, Esq., Officiating Secretary to the Government of India, Home Department; dated Allahabad, 5 August 1876.

THE High Court of Judicature for the North-Western Provinces has observed in the "Gazette of India" a letter addressed by you to the Secretary to Government, North-Western Provinces, dated Simla, 7th July 1876, of which it has recently been favoured with a copy through the Local Government.

2. In that letter you inform the Local Government that his Excellency in Council has been pleased to pass a grave censure on the High Court, and to condemn and visit with a severe punishment a Magistrate subordinate to the Court. You point out, at the same time, the course which in the discharge of his judicial duties the Magistrate should have pursued, and thus suggest the inference that the High Court is blameable for its omission to issue similar directions.

While it entertains all due respect for the high authority you represent, the High Court desires to submit the following observations for the consideration of his Excellency in Council.

3. The procedure adopted by his Excellency in Council gives rise to most important questions touching the position of the High Courts of Judicature in reference to the executive authority of his Excellency in Council.

4. In establishing Supreme Courts of Judicature in the Presidency towns, the Sovereign delegated his inherent powers for the administration of justice to

tribunals which, in the exercise of the functions committed to them, were to be generally independent of the Executive.

5. When Parliament empowered Her Imperial Majesty to substitute for the Supreme and Sudder Courts High Courts of Judicature, it was its intention to provide for the creation, in those parts of British India to which Her Imperial Majesty might be advised the privileges could be conceded, of independent tribunals, similar to those which had theretofore exercised jurisdiction in the Presidency towns.

The Statute 24 & 25 Vict. c. 104, which gave effect to this purpose, declares that the Judges of the High Courts shall hold office during Her Majesty's pleasure; and confers on the Governor General in Council, or the Governors in Council, as the case may be, no other powers in respect of the appointment or removal of Judges than the power to receive their resignations, and to make temporary appointments to vacancies in the Court until Her Majesty's pleasure be known.

The 9th section enacts that each of the High Courts to be established thereunder shall have and exercise all such civil, criminal, &c. jurisdiction, and all such powers and authority in relation to the administration of justice, as Her Majesty may by her Letters Patent direct, but subject to such limitations as are prescribed thereby; and that, save as by her Letters Patent may be otherwise directed, and subject and without prejudice to the legislative powers of the Governor General in Council, &c., the High Courts shall have and exercise all jurisdiction and every power and authority whatsoever in any manner vested in any of the Courts abolished under the Acts, &c. By the 15th section of the same Statute, it is declared that the High Court shall have superintendence over all Courts which may be subject to the appellate jurisdiction, and power to make general rules for regulating practice and procedure of the subordinate Courts, to prescribe forms, and to settle tables of fees, provided that such general rules, forms, and tables are not inconsistent with the provisions of any general law in force, and shall before they are issued have received the sanction of the Governor General in Council.

6. The Letters Patent creating the High Court for the North-Western Provinces do not subject the High Court to the executive power of the Governor General in Council, further than by declaring Her Majesty's pleasure that the Court shall comply with such requisitions as may be made by the Government for records, returns, and statements in such form and manner as the Government may deem proper.

7. Seeing, then, that the Judges of the High Court derive their powers immediately from Her Imperial Majesty and from Parliament, and are directly responsible to the supreme authority of Her Imperial Majesty for the proper discharge of the functions committed to them, the first question that arises is, whether they are subject to the executive power of his Excellency in Council further than is declared by the Statute or by the Letters Patent, and whether it is within the province of his Excellency in Council in a published resolution to approve of or condemn the action of the Court in any matter which falls clearly within the functions committed to the Court.

8. The next question that arises is, whether, in distinctly conferring on the Court all such powers and authority for and in relation to the administration of justice within the territory subject to its jurisdiction, as Her Majesty might by her Letters Patent direct, save as might be thereby expressly limited, and subject to the legislative powers of the Governor General in Council, and in committing to the Court superintendence over all Courts subordinate to its appellate jurisdiction, it was not the intention of Parliament to exclude the executive authority from such functions, and consequently whether it is not beyond the competency of any authority other than the High Court to instruct the subordinate Courts touching the conduct of their judicial duties.

The Court must not be understood as questioning the competency of his Excellency in Council to notice and punish misconduct on the part of an officer of a subordinate Court, though it ventures to think this power might be more fairly exercised after reference to the High Court to which the officer is subordinate; but it is submitted that, in the exercise of this power, regard should be had to the peculiar functions committed to the High Court, and any declaration avoided

avoided as to the law which should have been administered or procedure which should have been adopted in a particular instance, seeing that, proceeding from so high an authority, any such declaration could not but influence the subordinate Courts in other cases.

If it be competent to any other authority than the High Court to exercise such functions, conflicting directions may confuse the subordinate Courts, and impede the administration of justice.

9. The Court believed that this important distinction between the functions of the Executive Government and the High Court had in a measure been recently recognised by the Governor General in Council, in the sense for which it now contends, on the occasion of a reference made, at the instance of the Court, by the Honourable Sir William Muir, when holding the office of Lieutenant Governor of the North-Western Provinces.

10. But, assuming that the action of his Excellency in Council is within his high prerogative, the Court cannot but regret that no intimation was conveyed to it of the intention of his Excellency in Council to take action, and no opportunity afforded it for explanation or statement before the publication of your letter in the "Gazette." The course pursued has obliged the Court to invest the vindication of its office with an appearance of protest, which the high respect it owes to his Excellency in Council would have induced it on any less grave occasion to avoid. Having regard to the source from which its functions are derived, the Court submits it was entitled to expect an opportunity of addressing his Excellency in Council before the publication of a resolution which cannot but impair its authority.

11. The case of *The Crown v. Fuller* was, it is believed, first brought to the notice of the Government of India by the published translation of extracts from the vernacular press. These translated extracts are not furnished to the Court, and the first intimation which the Court received of the proceedings in *The Crown v. Fuller* was contained in two letters from the Secretary to the Local Government. In the first letter it was mentioned that the case had attracted the attention of the Government of India, and it was suggested that the Judges might wish to see the papers; and in the second letter the record was enclosed, and the opinion of the Judges requested by his Honor the Lieutenant Governor as to the adequacy of the sentence.

12. Some of the Judges doubted whether they ought to express an opinion on a question which it was competent to the Government to bring formally before them by motion in Court. But as a matter of courtesy, and in the belief that the Local Government was acting in concert with the Government of India, the record was submitted to each of the five Judges who constitute the Court, and an unanimous opinion was recorded that the sentence, though lighter than the Court would have been disposed to inflict, was, under the circumstances, not specially open to objection, and therefore did not call for interference. This opinion was communicated to his Honor the Lieutenant Governor.

13. His Excellency in Council expresses his regret that the Court should have considered its duties and responsibilities in this matter were adequately fulfilled by the expression of such an opinion.

14. The Court may allow it would more properly have discharged its duty had it pointed out to the Government that, if doubt were entertained of the propriety of the sentence, it should be moved to exercise its powers of revision by one of the three law officers appointed to represent the Government in the High Court. The procedure adopted deprived the Court of the advantage of hearing the arguments of the law officers of the Crown.

15. It is doubtless within the competency of the Court, of its own motion, to call for and revise the proceedings of the subordinate Courts, and it not unfrequently exercises this power, although, for reasons which are obvious, it is at all times chary of interfering to enhance sentences passed by the subordinate Courts, but it also permits parties to the proceedings to move it to exercise its powers of revision. It is submitted that it would be more convenient if, when the Government, which is a party to every criminal proceeding, is alive to any apparent defect in the administration of criminal justice, it moved the Court,

through its law officers, to call for the proceedings, and, if necessary, to correct them in revision.

16. When, however, the Court, at the instance of the Government, had perused the record, and had arrived at the opinion that, on the facts found by the Magistrate (facts which his Excellency in Council admits to have been correctly found), the sentence was inadequate, but not so inadequate as to call for interference, the Court fails to perceive that, in abstaining from further action, it showed itself insensible of its duties or responsibilities.

Whilst giving, as it is at all times prepared to do, the fullest consideration to the opinion of his Excellency in Council on the adequacy of the punishments awarded by the Courts in any class of cases, the Court is assured his Excellency in Council will admit that any Court (superior or subordinate) would violate its duty if in any particular case it suffered its own convictions as to the sentence which the ends of justice required it to pronounce or affirm to be overridden by any other consideration.

17. In view of the stricture publicly passed on the course pursued by the Court, the Court feels it due to itself to explain its opinions as to the duties of a Magistrate, and the law which in such cases as that of *The Crown v. Fuller* he is bound to administer.

The 196th Section of the Code of Criminal Procedure declares in what cases a Magistrate is to make a commitment. The Court reads this section, and instructs the subordinate Courts, that a Magistrate is to commit an accused person only when *he is satisfied*, from evidence which appears to him fairly trustworthy, that there is a *prima facie* case against the accused, that he has committed an offence triable exclusively by the Sessions Court or High Court, or an offence which, *in the opinion of the Magistrate*, he himself is not competent to visit with an adequate sentence. Where, then, a Magistrate, acting in good faith, gives effect to his own convictions, he simply does his duty, however unwisely, in dealing with the accused himself. If a Magistrate were to commit an accused person without being satisfied there were grounds or cause for the commitment, he would be guilty of a breach of duty, and of an injustice for which there is no remedy. On the other hand, if he has, through an error of judgment, failed to commit an accused person when he should have committed him, or passed on an accused person an inadequate sentence, the law provides for the revision of his proceedings.

18. But the Court is constrained to inform his Excellency in Council it could not direct the subordinate Courts that, on the facts disclosed by credible evidence in Fuller's case, it would be the duty of a Magistrate to commit an accused person either on a charge of culpable homicide or of voluntarily causing grievous hurt.

19. With some additions, and one slight alteration, those facts are correctly stated in the second paragraph of your letter. Kutwaroo, the deceased, was a well-developed and muscular man. Fuller struck him twice on the head and face with his open hand, and seized him by the scalp-lock. Kutwaroo fell to the ground, whether of his own accord, or by reason of force exerted by Fuller, the evidence leaves doubtful. He then rose and ran into an adjoining compound, a distance of two hundred or three hundred yards, where he again fell down. In the report of the *post-mortem* examination, Dr. Christison records that there were no external marks of violence, that the spleen was ruptured on its inner surface, and that "the cause of death was probably a fall or a blow over the spleen," and that a slight injury might be sufficient to cause this result. On cross-examination in the Magistrate's Court, Dr. Christison deposed that, in his opinion, a man receiving so serious an injury of the spleen as that he had described would have been unable to do anything in the way of exertion afterwards, as he would be rapidly weakened by the loss of blood, and that he should not have expected a man to be able to run two hundred or three hundred yards after receiving the injury described.

20. It also appears from the record that the Magistrate was careful to inquire of all the witnesses whether Fuller was in the habit of striking his servants. The coachman, who had been in Fuller's service for fourteen months, swore that

Fuller

Fuller had not during that period on any other occasion beaten any of his servants.

21. On referring to the Court's letter in answer to the Secretary to Government, North-Western Provinces, it will be seen that the Court so expressed itself as to leave it open whether the fall in Fuller's compound, which the Court considered the more probable cause of death (for it was not shown that Fuller had struck the deceased over the spleen), was the direct or indirect result of the assault, and that the Court adverted to the medical evidence, showing that the injury might have been occasioned by moderate violence or by a fall. But, assuming the injury to the spleen was the direct result of the act of Fuller, the Court would be unable to hold that, under the circumstances, Fuller could by the law of India have been convicted, or properly placed on his trial, for either of the grave offences suggested in the 7th paragraph of your letter.

22. The law of India relating to offences against the person differs materially from the law of England. Under the law of England, a man who commits an unlawful act, and in the commission of such act involuntarily causes death, is guilty of murder, if the unlawful act be a felony, or what is known to the law as a *malum in se*; and he is guilty of manslaughter if death ensues from any other wrongful act committed without justification or excuse.

The framers of the Indian Penal Code denounced these principles of the law of England as unworthy of enlightened legislation. Speaking generally (for there are exceptions), they proceeded on the principle that a man should be held criminally responsible only for such results of his act as he intended or knew to be probable.

23. To take the case suggested by Lord Macaulay: If a man, while stealing a handkerchief from a pocket, accidentally caused the explosion of a loaded pistol which the owner of the handkerchief carried without the knowledge of the thief, and in consequence of such explosion the owner was shot and died, the thief would by the law of England be punishable for murder, while by the law of India he could only be convicted of theft. To take another case: If a man, while shooting deer without leave in another's park in sport—without any felonious intent, and after having taken every reasonable precaution to avoid injury to bystanders,—by his shot kills a bystander and a deer, he is by the law of England amenable to a charge of manslaughter, whereas by the law of India he is amenable only to a charge of mischief in killing the animal.

24. By the law of India, as by the law of England, a person causing bodily injury to another who is labouring under a disorder, disease, or bodily infirmity, and thereby *accelerating* the death of that other, is deemed to have "caused his death." Nevertheless, every causing of death does not amount to the offence of culpable homicide. Unless it be proved that a person who has caused the death of another caused death with the intention,—

(1.) To cause death;

(2.) To cause bodily injury likely to cause death;

(3.) To cause such bodily injury as he knew to be likely to cause death to the person to whom the harm is done; or,

(4.) To cause bodily injury to any person, sufficient in the ordinary course of nature to cause death;

or with the knowledge—

(5.) That he was likely by his act to cause death; or,

(6.) That his act was so eminently dangerous that it must, in all probability, cause death, or such bodily injury as is likely to cause death,

the person who has caused death cannot, by the law of India, be convicted of culpable homicide of either description. [*Note on the Amendment of the Penal Code by the Hon. J. F. Stephen.*]

25. Nor can a person be convicted of the offence of *voluntarily* causing grievous hurt, unless it be proved that he caused one of the descriptions of hurt defined in the Code as "grievous" hurt either by means whereby he intended to

cause such hurt, or by means which at the time of employing those means he knew or had reason to believe to be likely to cause it. (Indian Penal Code, Section 39.)

26. In Fuller's case there was no evidence that he had committed any of the kinds of hurt defined in the Code as "grievous hurt," and although a person is by law presumed to know and to intend the ordinary and probable result of his acts, the result could hardly be declared ordinary or probable, while the circumstances rebutted the presumption of intention or knowledge to commit either culpable homicide or grievous hurt.

27. If it be held that, because disease of the spleen is not uncommon in this country, and because, when persons are afflicted with the disease in a particular form, death may result from very slight violence, therefore, every person must be presumed to know that in striking a Native he is likely to cause death, it follows that every person, as well Native as European, who strikes a Native is amenable to a far more serious charge than that under which such offences are now usually punished.

The Court, in view of the consequences, does not find itself justified in directing the subordinate Courts to adopt a presumption which the infrequency of a fatal result does not appear to warrant.

28. Your letter contains no allusion to the 304th section of the Indian Penal Code, enacted in 1873, which renders a person criminally responsible when death results from his rash or negligent act. It is presumed that this provision of the law did not appear applicable, and with this view the Court is disposed to agree.

29. A section drafted in 1870, which provided for the punishment of illegal killing, and defined that offence as the causing of death by an illegal act in cases other than those which constitute culpable homicide, would have met the circumstances assumed in Fuller's case; but the section was withdrawn or rejected in Committee, and it is clearly opposed to the principles on which the Code was framed.

30. In the opinion of the Court, Fuller, although he caused hurt, and more than hurt, only intended to cause hurt, and only used means which he knew or had reason to believe to be likely to cause such hurt. He was therefore properly convicted of voluntarily causing hurt without adequate provocation.

31. In the view taken by the Court of the law it is bound to administer, that ordinarily an accused person is liable to punishment only for such results as he intended or knew to be probable, the Court could not direct the subordinate Courts that on such facts as were disclosed in Fuller's case a heavier sentence should have been imposed than a Magistrate is competent to pass on a European British subject, namely, rigorous imprisonment for three months and a fine of 1,000 rupees, nor that a much lighter punishment than a Magistrate is competent to inflict would not have satisfied justice.

32. Furthermore, the Court would be unable, in the view it entertains of the law, to direct the subordinate Courts that, in awarding the punishment of fine, they should regard the compensation due to those who are indirectly injured by the commission of an offence.

The Court admits that a Magistrate may properly consider whether compensation has been voluntarily made by the offender, because such an act is an indication of contrition. But, even in this respect, the Magistrate must exercise judgment, otherwise it would be competent for the rich to secure a partial immunity from the consequences of their offences. But where no compensation has been voluntarily made, it is the duty of the Magistrate in imposing a fine to have regard only to the ends of justice (that is to say, the deterring others from the commission of the offence) and the means of the offender. The 308th section of the Code of Criminal Procedure does not convert a court of criminal justice into a forum for granting civil relief. When the Magistrate has determined the amount of the fine he should impose in view of the considerations above mentioned, he is empowered to order the payment "to the complainant or the party injured," or both, of the whole or a part of the fine as compensation for the

the expenses of the prosecution, or for the offence, and "in any subsequent civil proceedings relating to the same matter" the Court must take into account the sum so awarded.

33. But the relations of Katwaroo were not left without a remedy, inasmuch as the Indian Act XIII. of 1855 allows the wife, husband, parent, and child of a person whose death has been caused by a wrongful act to maintain a suit and recover damages in respect thereof.

34. In determining what degree of punishment is required in the interest of the public, the Court is accustomed to consider whether an offence is increasing or decreasing in prevalence. The circumstance that the class of offence which evoked the indignation of his Excellency in Council is dying out argues that the sentences heretofore awarded by the Courts have not proved insufficient for the ends of justice. The Court desires to assure his Excellency in Council that it views such offences with as much abhorrence as has been expressed by the Government of India, and that should necessity be shown, it will not be slow to avail itself to the utmost of the powers confided to it for their repression, and to point out to the subordinate Courts that severity has become a duty.

35. The Court is constrained to express its apprehension that the imposition on a magistrate of a severe penalty, for what in any view was a mere error of judgment in a single instance, is calculated to deter from the impartial discharge of their duty all those officers who are dependent on the Executive for their advancement. The Court therefore ventures to solicit his Excellency in Council to reconsider the orders passed on the Joint Magistrate, Mr. Leeds, an officer who during a long service has, by his ability and diligence, earned the respect of the High Court, and, it is believed, the confidence of the Local Government, and whose action could not but have been influenced by the views of the law entertained by the Court to which he is subordinate.

36. Should his Excellency in Council be unable to resolve the questions suggested in the 2nd to 10th and 15th paragraphs of this letter in a sense favourable to the independence and authority of the High Courts, the Court prays that the points raised may be referred for the consideration and orders of the Most Noble the Principal Secretary of State for India.

I have, &c.
(signed) *W. Tyrrell*, Registrar,
High Court, North Western Provinces.

No. 647A, dated *Naini Tal*, the 31st August 1876.

From *B. W. Colvin*, Esq., Officiating Secretary to the Government of the North Western Provinces, to the Officiating Secretary to the Government of India, Home Department.

IN continuation of my letter, No. 610A, dated 15th August, I am directed to forward, for the consideration of his Excellency the Governor General in Council, the accompanying Minute* recorded by the Honourable the Chief Justice of the High Court of Judicature for the North Western Provinces regarding the case of *Regina v. Fuller*.

* Dated the 18th of August.

MINUTE by the Honourable Sir *Robert Stuart*, Chief Justice, North Western Provinces, respecting the Resolution of the Government of India in the Case of *Regina v. Fuller*.

THE terms of the Court's letter to the Government of India on the published resolution in *Regina v. Fuller* were carefully considered by me, and, in full concurrence with my colleagues, had and have my entire assent. But the matters embraced in that letter have suggested to my mind considerations, my views as to which I desire to record in this form.

2. That letter by the Court raises and determines four very serious questions. The first relates to the authority and powers of this High Court; the second has regard to the relative authority and powers of his Excellency the Governor General in Council; the third deals with the merits of the case of *Regina v. Fuller*; and fourth, and in connection with these merits, and generally, the position of Mr. Leeds, who tried, convicted, and sentenced Fuller.

3. It results from the examination afforded by paras. 4, 5, and 6 of the Court's letter, that the High Courts of Judicature in India are not the Courts, in any sense, or in any degree, of the Government of India, or of his Excellency the Governor General in Council, but the Courts of Her Majesty the Queen, constituted and established by Her Majesty, not arbitrarily or for any undisclosed reasons, but constitutionally, on the public grounds and conditions, and for the purposes and with all the rights and privileges with which Her Majesty has thought fit to invest them: the principal of these being that the High Courts, or any of the Judges thereof, were not to be answerable for any act of duty done in virtue of their office to any authority whatever, save that of Her Majesty herself in Council. This distinctly and sufficiently appears from the express terms of the Charters of the several High Courts; and with respect to the High Court Act, 24 & 25 Vict. chap. 104, such characteristic quality and position of the High Courts is one of the provisions applicable to the old abolished Supreme Courts; which, by Sect. 11 of the said Act, are revived and applied to the substituted High Courts, as will presently appear.

4. The 9th section of the Statute 24 & 25 Vict. chap. 104, referred to in para. 5 of the Court's letter, further provides, that "the High Court to be established in each Presidency shall have and exercise all jurisdiction, and every power and authority whatsoever, in any manner vested in any of the Courts in the same Presidency abolished under this Act at the time of the abolition of such last-mentioned Courts;" and by Section 10 of the same Act, it is provided that "all jurisdiction now exercised by the Supreme Courts of Calcutta, Madras, and Bombay respectively over inhabitants of such parts of India as may not be comprised within the local limits of the Letters Patent to be issued under this Act establishing High Courts at Fort William, Madras, and Bombay, shall be exercised by such High Courts respectively." Section 11 provides that all laws then in force applicable to the abolished Supreme Courts, or to the Judges of those Courts, "shall be taken to be applicable to the said High Courts and to the Judges thereof respectively, so far as may be consistent with the provisions of this Act and the Letters Patent to be issued in pursuance thereof, and subject to the legislative powers in relation to the matters aforesaid of the Governor General of India in Council; and Section 12 saves all proceedings pending in the abolished Courts, and provides that "such proceedings, and all previous proceedings in the last-mentioned Courts, shall be dealt with as if the same had been had in the said High Courts, save that any such proceedings may be continued, as nearly as circumstances permit, under and according to the practice of the abolished Courts respectively."

5. By Section 16 of the same Act Her Majesty is empowered by Letters Patent to erect and establish a High Court of Judicature for the North Western Provinces, with the like jurisdiction, powers, and authority as were conferred on the other three Courts, as far as circumstances may permit; and this intention has been fully carried out by the Court's charter, issued by Her Majesty's warrant under the Great Seal of England on the 17th day of March 1866, in the 29th year of Her Majesty's reign.

6. In order adequately to apprehend and appreciate the full force of these provisions of the High Court Act, it is necessary to advert to the terms of the charters of the abolished Supreme Courts. They are all three to the same effect, but that of Calcutta may be selected for the purposes of this Minute. This charter, after reciting the Act of Parliament under which it was granted, and stating the names and position of the Judges who were to compose the Court, goes on to provide as follows:—"And it is Our further will and pleasure that the said Chief Justice and the said Puisne Justices shall severally and respectively be, and they are, all and every of them, hereby appointed to be
justices

justices and conservators of the peace, and coroners, within and throughout the said provinces, districts, and countries of Bengal, Behar, and Orissa, and every part thereof; and to have such jurisdiction and authority as Our justices of Our Court of King's Bench have, and may lawfully exercise, within that part of Great Britain called England, by the common law thereof;" and it is further and subsequently provided in the same charter that "the said Supreme Court of Judicature at Fort William in Bengal should also be a Court of Equity, and shall and may have full power and authority to administer justice in a summary manner, as nearly as may be, according to the rules and proceedings of Our High Court of Chancery in Great Britain; and upon a bill filed, to issue subpoenas and other process, under the seal of the said Supreme Court of Judicature at Fort William in Bengal, to compel the appearance, and answer upon oath, of the parties therein complained against, and obedience to the decrees and orders of the said Court of Equity, in such manner and form, and to such effect, as our High Chancellor of Great Britain doth, or lawfully may, under our Great Seal of Great Britain." And it was also provided by the charter that the Supreme Court, besides being a Court of Common Law, like the Court of Queen's Bench in England, and a Court of Equity, like the Court of Chancery in England, should be a Court of Oyer and Terminer and Gaol Delivery, and "shall have the like power and authority as Commissioners or Justices of Oyer and Terminer and Gaol Delivery have or may exercise in that part of Great Britain called England, * * * and to proceed to hear, examine, try, and determine indictments and offences, and to give judgment thereupon, and award execution thereof, and in all respects to administer criminal justice in such and the like manner and form, or as nearly as the condition and circumstances of place and persons will admit of, as Our Courts of Oyer and Terminer and Gaol Delivery do or may in that part of Great Britain called England, * * * and to all other acts which shall be necessary for the due administration of criminal justice in such manner and form, or as nearly as the circumstances and condition of the case will admit, of Our Courts of Oyer and Terminer and Gaol Delivery may do in that part of Great Britain called England." And there are various other provisions of the same nature, all showing that the Supreme Court established by the charter was not only to be modelled in the English form in all respects, but to have its jurisdiction and authority protected and enforced on the same constitutional principles as those recognised in the case of the English Courts, the only difference being that, instead of proceeding by appeal and error in Parliament, the appeal from the Supreme Court was to be to the King in Council.

7. The charter of the Supreme Court contains anxious provisions where the old East India Company is a suitor before it, and for compelling the Company's appearance and their pleading where necessary; and with respect to the Governor General and his Council, the only provision which the charter contains relates to the safety of their persons and exemption from arrest, although in this respect the Chief Justice and Judges of the Supreme Court are placed on the same footing, and are similarly exempted.

8. The Supreme Court was thus thoroughly independent, and amenable to no authority whatever in the exercise of its official and judicial powers, save and except only to the King in Council, and even then in regard only to "judgments, decrees, orders, or rules."

9. Such were the character, authority, and powers of the old Supreme Courts; and if there was nothing else on which to base the complete independence of the High Courts as the successors of the former, in the exercise of their functions, the above recitals would surely be enough, showing, as they do, not only that the Supreme Courts enjoyed the independent authority and prestige of English Courts, but that they were judicially answerable solely and only to the King in Council. The express words of the charters of the High Courts, however, in which there is not the slightest recognition, directly or indirectly, or by any kind of implication, of any authority over, or right of interference with, these Courts by the Governor General in Council, or any other prerogative authority whatever in India, leave no doubt on the subject.

10. Irrespective, however, of any such provisions of the law, the reasons and

the policy which determined Parliament and the Crown to invest Her Majesty's Courts and Her Majesty's Judges in India with such official and judicial independence are very apparent.

11. In the first place, the investment of the Courts with such independence exceedingly increases and magnifies the responsibility of the Judges to Her Majesty for any errors, misconduct, or misfeasance with which they might be chargeable. In the second place, there are no persons or authorities in India possessed of qualifications which could fit them to supervise or in any way control Her Majesty's Courts; for, I say it with all respect, his Excellency and his Council, with one exception, are not, legally and technically, learned persons. They have not within themselves as a body, necessarily and intrinsically, any official, forensic, or judicial training or experience in matters of law, and they could not, however justly disposed (and they could not be otherwise than justly disposed), satisfactorily perform the duties of directors or superintendents of the Courts. I say with one exception, although even my honourable and learned friend Mr. Hobhouse, who so ably fills the place of Legal Member of Council, would not, I am sure, maintain that he is either entitled himself to exercise, or that, by force of his great knowledge and position, he can impart to his Excellency and the other Members of Council any Pretorian powers in the way of supervision, direction, or control over these Courts. And, in the third place, any such authority on the part of the Governor General in Council would lead to the anomaly of the Crown acting inconsistently with, if not contradicting, not only its own Royal Charters, but the legislative enactments of the Imperial Parliament itself. His Excellency the Governor General in Council in India acts in a purely delegated character, and exercises delegated authority, and not independently of Her Majesty the Queen and her Government, as represented by her Secretary of State; and all his acts, resolutions, and proceedings are subject to Her Majesty's allowance or disallowance; and any resolution, therefore, of his Excellency at variance with, or purporting to be at variance with, the prerogatives and independence of the Queen's Courts, would impose on Her Majesty and her Ministers the painful and anomalous duty of considering whether they would treat the Indian Courts in a manner different from, and other than, the consideration and respect which, in a similar or corresponding issue, would undoubtedly be shown by another Department of Her Majesty's same Government to the Courts and Judges in England. But this I hope I may believe could not possibly be. No Home Secretary in England would dream of interfering, by the expression of regrets, or of opinions of approval or disapproval, with the manner in which the English Judges discharge their duties and responsibilities; and it appears to me difficult, if not impossible, to understand that Her Majesty's Secretary of State for India would be otherwise disposed in the case of Her Majesty's Indian Courts.

12. The only element in the High Courts which might be supposed to favour, however covertly, any opposite contention might perhaps be imagined to be the presence in the High Courts of Judges who are the representatives and successors of the old Sudder Courts, which undoubtedly were to a great extent under the influence and control of the Government of India, and even of the Local Government. But the Sudder Courts were entirely abolished by the High Court Act, and it is important to observe that it is *after*, and not before, the section abolishing these Courts that its provisions determining the independent character of the Court and the appeal to Her Majesty in Council are to be found. Nor, unlike the provisions relating to the old Supreme Court, to which I have referred as having been revived and made applicable to the High Courts, is there a single word or expression in the Act, or in any of the High Court's charters, saving or continuing any portion, feature, or quality of the Sudder Courts. The independent character, therefore, of the High Courts is wholly unaffected by the presence, if any, in its constitution of the Sudder Court element.

13. The ninth paragraph of the Court's letter states that the distinction between the functions of the Executive Government and the High Court have, in a measure, been recently recognised by the Governor General in Council, on the occasion of a reference made by the Hon. Sir William Muir, now a Member of Council, but then Lieutenant Governor of these Provinces. But it appears to me that

that it would be useful to advert more fully to the circumstances of that case, showing how completely justified the Court is in referring to it.

14. That was the case of *Girdhari Lal v. Hearsey*, and the question which was ultimately referred for consideration to the Government of India arose in this way. While at Dehra Dún in camp, in the cold season of 1872 and 1873, the Lieutenant Governor paid a visit to the jail, and found there Girdhari Lal, the plaintiff in the suit, who ultimately, by reason of the defendant's plea of minority, lost his case in the High Court with costs, and it was for these costs, which he was unable to pay, that he was in jail.

15. The man being in prison under such circumstances excited the Lieutenant Governor's sympathy, and his Honor had recourse to the expedient of drawing up a resolution, dated 23rd January 1873, the third paragraph of which was as follows :

“The Lieutenant Governor accordingly thinks that the Subordinate Judge should take the earliest opportunity of proceeding under Sections 280 and 281 of Act VIII. of 1859, and calling on the prisoner to file a list of his property, against which proceedings may be taken; and in default of any further means of payment being shown to exist, that the Subordinate Judge should consider whether, under the provisions of the law, he should not be released from further imprisonment.” It will be observed that there is here, directly from the Lieutenant Governor to the Subordinate Judge, what is neither more nor less than a judicial order that certain procedure should be adopted for the prisoner's release from jail, and it was ordered by his Honor that a copy of this resolution should be sent to the Subordinate Judge at Dehra and to the High Court.

16. The irregularity of this proceeding on the part of his Honor at once attracted the attention and action of the High Court; and a correspondence ensued, in which the Court pointed out to the Lieutenant Governor the error he had committed, under a mistaken view of his position and duty, by interfering, as he had done, with the Court's process, informing him distinctly that “it was the interference with a judicial officer's procedure in his Court that the Court thought it necessary to notice. It regrets to see, from the concluding portion of the 2nd paragraph of your letter, his Honor still justifies his action.” The correspondence ended by the Court's requesting that a complete copy of it should be forwarded to the Government of India.

17. In due time the Government of India communicated its opinions on the case, and there is now before me the letter from the Government of India (marked Home Department, Judicial, dated the 20th March 1874), in which these opinions are explained. In this letter, his Excellency in Council points out a misapprehension on the part of the Lieutenant Governor of the precise question for the determination of which the High Court had requested that the correspondence might be forwarded to the Government of India, and correcting that misapprehension, his Excellency proceeds to remark as follows :—“But the matter upon which the High Court throughout this correspondence have laid stress relates, not to the tenor of these instructions, given on the spot after a visit to the jail, but to the form and substance of the instruction contained in the resolution, which was published and communicated to the Court and to the Subordinate Judge of Dehra, in which the Subordinate Judge was prompted to proceed under certain sections of the Civil Procedure Code, and to call on the prisoner to file a list of his property. * * * * And what the High Court contend is, that instructions and suggestions, such as those contained in this resolution of the 23rd January, as to the course which they should pursue in the discharge of their judicial duty, should not be communicated to judicial officers subordinate to the Court. Upon this point I am to say that his Excellency the Governor General concurs with the opinion expressed by the High Court, and considers that it is undesirable to issue such instructions, or to publish them in a resolution. And though his Excellency in Council is by no means prepared to lay down that the chief executive authority of a province may not properly and usefully admonish Judges in other departments of action, still less that he may not see that all remedies which the law permits are fully applied to remove unnecessary hardships in the law's operations, yet I am to

observe that functions of this kind should be exercised with caution, especially having regard to the statutory powers of superintendence vested in the High Court ;” and the letter of his Excellency ends thus :—“ Though of opinion that the terms of the resolution in question have been justly objected to by the High Court, the Government of India wish at the same time to express their entire approval of the object which the Lieutenant Governor sought to attain by the instructions of December 1872, and with the tenor of those instructions.” This letter from the Government of India appears to be conclusive as to its understanding of the distinction between the functions of the Executive Government and the High Court.

18. The independence of the High Courts in relation to the Executive Government being thus thoroughly established, and also fully recognised by the Government of India itself, we were scarcely prepared for the communication from the same quarter which, to our extreme surprise, we have received, and which has occasioned this discussion. For that such a communication at least purports to, and shows a disposition to, invade the Court’s independence is clear, even if it actually and legally does not and cannot have that effect ; and the Court is entitled to complain of, and to remonstrate against, such an attitude on the part of the Executive Government towards it, as relatively an independent institution.

19. The “ regret ” expressed by the Governor General in Council in the fourth paragraph of the letter referred to is really a judgment by his Excellency, arrived at by his mind being judicially exercised, and after calling the High Court to his bar. Now, the mere statement of such a view of the matter, a statement which, however apparently extravagant, is nevertheless, with reference to the scope of the paragraph, a perfectly correct one, is almost enough to show how untenable is the position taken by the Government of India towards the High Court. But this false position (if I may, without disrespect, say so) on the part of the Government towards the Court will further appear from what actually occurred in the case of *Regina v. Fuller*, so far as the Court is concerned.

20. That case was first brought to the knowledge of the Court by a demi-official letter from the present Local Government of these Provinces to Mr. Tyrrell, the Court’s registrar, dated the 31st of March last, enclosing the record of the case, and begging that it might be laid before the Judges, and asking their opinion as to the adequacy of the sentence. This was the first time the case came before the Court at all, and it will be observed that, however judicially the Court may be supposed to have been consulted by the Local Government, the case did not come before the Court in the form of an appeal, or by way of revision, or by any method or proceeding which necessitated or involved any hearing *in foro*, with a judicial determination thereon. The Court’s opinion was simply asked as a matter of courtesy, and in accordance with a practice on the part of the Local Government of consulting the Court simply by letter, where any legal difficulty was experienced in its administration—a practice, however, which I have often felt was open to many objections. Of course the Court is not bound to answer such inquiries, but the disposition of the Judges is always, if possible, to assist the Government, although they generally keep in view the possibility of the matters so submitted to them being brought before them in their proper judicial capacity.

21. On this subject the observations in the Court’s letter leave nothing material to be added, and they ought, I think, to be conclusive, to the mind of any one of judicial experience in criminal cases in India, as to the position in which the High Court was placed, not by any act of its own, but on the unanticipated invitation of the Local Government.

22. As stated in the Court’s letter, any fault that could be imputed to Mr. Leeds was at most an error of judgment, and in a single instance, and to punish him in the manner intimated in the Government’s letter appears to me to be not only unjust and unreasonable, but also contrary to law. For Mr. Leeds, however amenable in a general sense, personally and socially, to the Government of India and their subordinate Governments, was not in any way answerable to any Government authority for his *judicial* conduct. In that respect,

spect he is amenable only to the High Court, and it is not even usual to entertain complaints against subordinate judicial officers without communication and consultation with the High Court as the legally constituted superior authority.

23. Respecting Mr. Leeds' conduct, however, it does not appear to me that he was guilty of any serious error of judgment; and I humbly venture to think that, having regard to the principles of culpability recognised by the criminal law, Mr. Leeds' comparative immunity from error is shown in the manner in which the facts are referred to in the letter of the Government of India itself. It is there stated that Mr. Fuller struck the syce with his open hand on the head and face, and pulled him by the hair, so as to cause him to fall down. Mr. Fuller and his family drove on to church; the syce got up, went (it would have been more correct to have said ran) into an adjoining compound, and there died almost immediately. It would appear from the medical evidence that the spleen of the deceased was in such a diseased state that very slight violence, either from a blow or fall, would have been sufficient to have caused death. Indeed, it is plain that a mere accident to the man, such as his tripping while walking or running, might have had this fatal result, but that there is nothing in the case to show that such extreme and perilous sensibility of body was known to, or could have been reasonably suspected by, Mr. Fuller; and his guilt or criminal responsibility would have been the same, and neither more nor less, if Katwaroo had not died. The letter of the Government of India goes on to state that "the death of Katwaroo was the direct result of the violence used towards him by Mr. Fuller," and his Excellency in Council observes that "the High Court assumes the connection between the two events as being clear," but adding, "yet, on reading Mr. Leeds' judgment, he does not find that that gentleman ever considered the effect, or even the evidence, of this connection." The portion of the Court's letter thus referred to is in these terms:—

"The medical evidence shows that the spleen was in a diseased condition; that death was caused by the rupture of the spleen; that this injury might have been caused by moderate violence, or by a fall; and that there were no external marks of injury on the body. Under these circumstances, it appears that no great violence was used, and that the accused neither contemplated, nor could have foreseen, that severe hurt would have resulted from the degree of violence exerted by him, much less that it should have been followed by the lamentable result of death."

It will be observed that Mr. Fuller's not very violent blow and Katwaroo's death are here stated as connected facts, but not in such a way as to show Mr. Fuller's culpability in regard to the death. In fact, it is unnecessary to dwell on the mere fact of the connection between the two circumstances, the material and vital question being, not whether the death did in fact result from the blow, but whether Mr. Fuller had such a guilty knowledge of the probable consequences as to make him really responsible for the fatal occurrence. But there is nothing in the record to show any such guilty knowledge on his part, or that he intended to occasion a hurt which would ordinarily or probably cause death, and every circumstance ought to have been distinctly proved, not left to any kind of inference or suspicion. With respect to Mr. Leeds' judgment, I must really venture to differ from his Excellency in Council, and suggest that that judgment proceeds on the evidence before the magistrate; that it distinctly states the fact of the blow or assault, as it may be called, and also Katwaroo's ultimate death; but it does not state, and, with great respect and deference, I submit it very properly does not state these as necessarily connected facts against Mr. Fuller in the way of measuring his culpability. Mr. Leeds was trying the case under Sections 319 and 323, Indian Penal Code, and, with the judgment now before me, I cannot see that he omitted any material consideration in any way arising out of the evidence.

24. Mr. Leeds cannot be charged with any mistake or error of judgment in taking a faulty view of the case before him under Sections 319 and 323, and it is correctly stated in the Court's letter that he could not have committed Mr. Fuller for trial on a charge of culpable homicide, or of voluntarily causing grievous hurt. But if, by any straining of any section of the Penal Code, Mr. Fuller had

been committed for trial before the Sessions Court or the High Court, the result would in all probability have been, and, I think, must have been, the same—if, indeed, the fine might not have been even less, for the syce had violated his duty and disobeyed his master's orders, and had incurred at least a severe reprimand, under which he might have equally taken to his heels, as Native servants often do when they are scolded, and thus ruptured his diseased spleen; for, on the evidence, it is not at all improbable that the running into the contiguous compound, ending with the fall there, caused the injury to the spleen and the death, or at least materially contributed to these two results.

25. Stated, however, at its worst, Mr. Leeds was guilty of nothing except a mistake or error of judgment, and if such mental shortcoming is to be visited with not merely judicial correction, but with personal punishment to the erring officer, there is not, I will undertake to say, a single magistrate of any grade, European or Native, in these Provinces—I might venture to say in all India—who could pass scatheless through such an ordeal. My experience, indeed, as a Judge of a High Court, does not point to any particular tendency on the part of magistrates to adopt a lenient view of cases on trial before them, whether the accused persons are Europeans or Natives, but quite the reverse; and I have been particularly struck with the severity which Native magistrates sometimes evince in these cases. Nor can I for a moment believe that, in his investigation of Mr. Fuller's case, Mr. Leeds was in any degree actuated, either in favour of Mr. Fuller or against Katwaroo, by any feeling relating to their being of different races. There is not the slightest indication, either in his judgment or in the record of Mr. Fuller's case, to indicate the existence of such a feeling, and I cannot appreciate the reasonableness of visiting Mr. Leeds with penal consequences, simply because he performed his duty according to the light of his intelligence, and with no improper or corrupt motive. He has always borne the highest character for industry and care, and no officer subordinate to the High Court has been held in higher esteem by the Judges. I find he has been in the Civil Service of India for about 15 years, and that he has actually served for about 12, and during the whole of that time no fault of temper or conduct has been entertained or recorded against him. I trust, therefore, that the reconsideration of this matter, as requested in the Court's letter, may have its intended effect, and that the penalty recommended to be inflicted on Mr. Leeds may be cancelled. Should this not be conceded, my fear is that the moral effect of such a state of things on the young magistracy of the country may be not such as the Government of India would desire. Already there have been indications of this, and I myself have recently had occasion to repress the undue zeal of some young magistrates.

26. In a previous part of this Minute I have referred to the regret expressed by his Excellency in Council respecting the conduct of the High Court in this matter, as being a judicial opinion which invaded the Court's independent authority; and it is, I think, scarcely too much to say that, if the power to administer such a censure could be justified, there is not a prosecution, suit, appeal, or any other judicial proceeding of the High Court with which the Government of India could not similarly interfere, not even excepting cases in which the Government of India itself is a party, and it is frequently a litigant. The very case under consideration is that of *Regina v. Fuller*, and his Excellency in Council might have been reminded that he himself, and not the friends of the deceased man, was the real and legal prosecutor, and, in that sense, Mr. Fuller's litigious adversary.

27. The Court's letter expresses regret on the Court's part that no intimation was conveyed to it of the intention of his Excellency in Council to take action, and no opportunity afforded it for explanation or statement before the publication of his Excellency's letter in the Gazette; and the Court further states that Fuller's case was, it is believed, first brought to the notice of the Government of India by published extracts from the vernacular press, and that these published extracts were not furnished to the Court; and the course thus pursued towards the Court does not appear from the Government of India's letter itself to have been, nor has it been in any way, explained, and this I deeply regret.

28. In some European countries the judicial office is not held in the high esteem with which it is regarded by the Government of Her Majesty the Queen and by the English Parliament, but is made subordinate to a Minister, who may, to a large extent, control the action of the Courts. But it is otherwise with regard to Her Majesty's Courts of Judicature, and Her Majesty's judges holding their commissions, as they do, direct from the Queen herself. These Courts and judges can even entertain and decide questions relating to the impugned validity of acts and proceedings of the Crown itself, and in India the High Courts can call in question the validity, and if necessary declare to be invalid, all acts, proceedings, and measures on the part of the Government which can be shown to be *ultra vires* of their province. And, so commissioned, this High Court will go on in the discharge of its duties and responsibilities, uninfluenced by any consideration other than the true exposition of the law and the sound administration of even-handed justice.

29. I have now, and only, in conclusion to assert, which I do most confidently, that no Court, body, or constituted authority could treat the natives of this country with greater consideration on all suitable occasions than this Court invariably does, never allowing any opportunity to pass of rebuking any misconduct towards them.

R. Stuart.

High Court, Allahabad,
North Western Provinces,
18 August 1876.

EXTRACT from MINUTES of a Meeting of the Council of *India*, held on Tuesday the 20th March 1877; the Marquis of *Salisbury* in the Chair.

THE two Despatches to India in the Judicial Department, reviewing and commenting on the proceedings in the case of Mr. Fuller, which were laid before Council on the 13th instant, were read, and, after long discussion, were, on the Question, approved, with certain alterations; Sir E. Perry being dissentient.

Ayes, 11; viz.:

Cassels, A., Esq.
Drummond, Hon. E.
Ellis, Sir Barrow.
Halliday, Sir F.
Maine, Sir Henry.
Montgomery, Sir R.
Muir, Sir W.
Strachey, Lieutenant General.
Wilde, Major General Sir A.
Wolseley, Major General Sir Garnet
Yule, Colonel Henry, C.B.

No, 1; viz.:

Sir Erskine Perry.

DISSENT by Sir *Erskine Perry*.

I MUCH regret that I feel compelled to record a dissent to these Despatches which in effect express approval of the proceedings of the Government of India in the Fuller case.

Every one must appreciate the motives which induced Lord Lytton's Government to denounce the practice of English gentlemen assaulting their native servants. If that practice is prevalent, which, however, I entirely disbelieve, Lord Lytton was not only justified, but highly to be commended, for expressing his strong personal disapprobation of it; but between such course and the Executive Government taking it upon itself to expound nice questions of criminal law and procedure, to find fault with the highest judges of the land because they differ from them, and to visit with a "severe penalty" a judge of

high character for ability and of long standing, because he has given a judgment that the Government disapproves, is a very wide gulf.

I have carefully examined the law and the proceedings in this case, and I am clearly of opinion with the High Court of Agra that no fault is imputable to the magistrate who pronounced the decision.

The real question before us is not whether the Government has the *right* to censure the decisions of the Supreme Courts of Justice, or to punish inferior judges for judicial indiscretion. Instances may readily suggest themselves of a "miscarriage of justice," or of "judicial corruption," such as is indicated in the Government Despatch (para. 28), where the right of criticism which belongs to every member of a free community can certainly not be denied to the Government with respect to the inferior judges, and in a country like India, the Executive is compelled to take notice of any gross incapacity in its magistrates, even to the extent of removal from office.

But the questions to be determined in this case are whether the Government has displayed a wise discretion in their interference with the decisions of the legal tribunals, and whether they have treated Mr. Leeds, the magistrate, with justice.

The first is a constitutional question of the very gravest character; the second is a purely legal one.

On the former of these subjects I will be very brief. Government in India, as in other Asiatic countries, is necessarily despotic, but it is made reconcilable to the conscience of a free country like England, by the existence of two considerable checks; first, the power of appeal to this country against every act of injustice or caprice on the part of Government; and, second, the existence in India of an independent judiciary. It is, no doubt, inconsistent with the theory of despotic rule that independent tribunals should exist, with the power to set aside acts of Government as illegal; and the slavish Roman lawyers invented the convenient doctrine "*quod principi placet legis vigorem habet.*" It is also apparent that a well-meaning, paternal Government, may be often thwarted by the decisions of judges, who consider themselves bound to administer the law set before them, without reference to political considerations. Temporary evils, even, may occur under this head, whilst confused or imperfect laws are allowed to remain on the Statute Book; but the remedy is simple. Strafford probably thought he was administering perfect justice when he took upon himself to decide cases in Ireland, and sneered at the lawyers who thought that England should be governed by their Year Books; but the good sense of England has rejected this pretension, and holds, as the cardinal article of its political faith, that nothing short of glaring misconduct will justify the interference of Government with the Bench. No one can impute such misconduct to the Agra High Court in the present case; and I doubt greatly the expediency of reminding the Judges of India, who are claiming immunity from Government interference, that they hold their offices by the tenure which produced the most shameful subserviency to the Government, on the part of judges, that is recorded in history.

With respect to the decision pronounced by Mr. Leeds, a minute examination of the Indian law is required. Rightly or wrongly, but after great deliberation, the Indian Legislature has altered the law of England which makes every case of homicide, resulting from an illegal act, a felony, triable before a superior judge and jury. Such a course may be well calculated to promote the sanctity of human life. But Lord Macaulay and his colleagues thought it very unjust that, where death occurred as a mere casualty, or misadventure from a slight blow or push, it should be punishable as a crime; and they framed their law accordingly.

The effect of that law is to eliminate the fact of death altogether from the offence, in a case such as is above suggested. When then, on the facts proved before Mr. Leeds, it appeared that the defendant had only struck the deceased twice with his open hand, and that death ensued from the rupture of a diseased spleen, which might have been occasioned by a slight blow or fall, Mr. Leeds was quite justified in keeping the fact of death out of his consideration. The exact question for him to determine was the amount of penalty to be inflicted for the offence proved before him, and this is a matter which the law of India, like the law of England, leaves greatly to the discretion of the judge; such discretion is governed by many circumstances, which most frequently are known only to the presiding judge; the frequency of the offence, the necessity of making

making an example, &c., &c.; but it would be a difficult task for any criminal judge, if he were called upon to prove in every case that the exact amount of punishment he had fixed upon, during the excitement of a criminal session, was the most fitting. If I had been the presiding judge in Fuller's case, I think that I should have inflicted a larger penalty, for I should have considered the civil injury sustained by the family of the deceased. But it would have been a stretch of the law to have done so, and an assumption of the powers of the Civil Court, and a judge is certainly not to be blamed for being too logical in administering criminal law. But the chief fault imputed to Mr. Leeds is that, on the evidence before him, he undertook to dispose of the case himself, instead of committing it to the Sessions. An examination of the Indian law and Indian law books, shows that this charge is not only unsustainable, but that he would have proceeded contrary to the direct orders of his superiors if he had done so. What is aimed at in Indian Administration is that magistrates should exercise their summary powers of conviction, and not commit to the Sessions, except in cases where their powers of punishment do not suffice to meet the offence. The Penal Code is framed on this view. The High Court of Bengal, in a Circular Order of 1865, expressly ordered magistrates not to commit to the Sessions unless he "finds, from aggravated circumstances, that higher punishment is required than he can award."

The High Court of Agra inform us that the magistrates in their jurisdiction are instructed to commit to the Sessions only, "when, in the opinion of the magistrate, he himself is not competent to visit (the offence) with an adequate sentence."

If Mr. Leeds was of opinion that his powers to inflict 1,000 rupees penalty and three months' imprisonment were ample, and more than ample to meet the case proved before him, he would have been liable to the censure of the High Court if he had committed to the Sessions. Moreover, the High Court have deliberately decided in this case with all the evidence before them, that it was not the duty of Mr. Leeds to commit. The Government of India, without apparently having this evidence before them, and the Secretary of State, certainly without it, decide to the contrary.

But it is also said that as there was conflicting evidence, and as three out of the four eye-witnesses gave a graver character to the charge than which Mr. Leeds considered proved, it was his duty to send the case for trial before a jury. Such a canon of procedure cannot hold good with those who have experience of Indian Courts of Justice. The facility with which native witnesses can be got together to swear anything, the tendency of low castes to uphold one another by unblushing mendacity, is so well known, that any judge who committed a case for trial because a lot of witnesses deposed to facts that he wholly disbelieved, would be justly visited with the censure of the High Court. On the whole, I am of opinion that, in reply to the Despatch now before us, great praise should be attributed to Lord Lytton for his desire to protect the natives from oppression; the claims of independence by the High Court should be placed on a right basis, and the decision as to Mr. Leeds should be modified, so as, if possible, to do him justice.

(signed) E. Perry.

21 March 1877.

(Judicial, No. 5.)

To His Excellency the Right Honourable the Governor General of India
in Council.

My Lord, India Office, London, 22 March 1877.

Para. 1. I HAVE received and considered in Council your letter of the 12th October 1876, No. 37, together with the letter of the Registrar of the High Court of the North West Provinces, and of the Chief Justice of that Court, enclosed therein.

2. These papers record the circumstances under which it seemed proper to your Excellency in Council to censure Mr. Leeds, Joint Magistrate of Agra, for

his proceedings in the case of Mr. Fuller, who was accused before him of an assault upon his servant, resulting in the death of the latter.

3. Your orders in this case have been commented upon at much length, both by the Court of the North West Provinces collectively, and by the Chief Justice of that Court separately. Exception is taken in these criticisms, both to the justice of the sentence passed upon Mr. Leeds, and to the propriety of any interference on the part of your Excellency's Government with the proceedings of the High Court, or of the tribunals subject to its jurisdiction. On the present occasion I will consider the first point only, reserving for another Despatch the grave constitutional questions raised by the protest of the High Court.

4. Two points in Mr. Leeds' conduct of this case are, in your judgment, open to censure. It was open to him to deal with the case himself, or to refer it to a higher Court. He decided to deal with it himself. When he had come to this decision, and had formed his judgment as to the precise legal character of the offence, it was open to him to inflict the full penalty within the scope of his powers, or to inflict a mitigated penalty. He decided to inflict a penalty so mitigated that, as you observe, it was merely nominal.

5. There can, I think, be no doubt that, upon these two points, Mr. Leeds possessed entire discretion to act according to his judgment, and for the mode in which that discretion was exercised he is, of course, responsible.

6. The fact that Mr. Fuller's violence resulted in the death of his servant, should, in your judgment, have led Mr. Leeds to remit the matter to a higher Court for trial, both because such a Court would have been more competent to sift the evidence on which the character of the offence depended, and also because, even if no graver offence had there been brought home to Mr. Fuller than that of which he was actually convicted, the higher Court would have possessed a far larger latitude of punishment. The same consideration should also, in your view, have induced Mr. Leeds, after he had decided to deal with the case himself, to have inflicted a severer penalty.

7. The High Court, on the other hand, dwells on the well-known departure of the Indian law from its English model in determining the effect of fatal consequences upon the criminal character of the illegal act.

"The law of India relating to offences against the person differs materially from the law of England. Under the law of England, a man who commits an unlawful act, and in the commission of such act involuntarily causes death, is guilty of murder, if the unlawful act be a felony, or what is known to the law as a *malum in se*; and he is guilty of manslaughter, if death ensues from any other wrongful act committed without justification or excuse.

"The framers of the Indian Penal Code denounced these principles of the law of England as unworthy of enlightened legislation. Speaking generally (for there are exceptions), they proceeded on the principle that a man should be held criminally responsible only for such results of his act as he intended or knew to be probable."

And the Court develops this consideration at some length.

8. I infer from the pains which the Court have taken to expound the Indian law upon this point, that in their view your Government has censured Mr. Leeds for not taking the fatal issue into consideration in deciding on the quality of Mr. Fuller's offence. If you had done so, your orders, certainly, could not have been upheld. But I do not see how any such construction can be put upon your words. You confine yourself to those parts of the magistrate's duty which were undoubtedly matter of discretion, his resolution to decide summarily, and the nominal amount of his sentence. Upon these points I agree with you in thinking that Mr. Leeds, having a discretion, was bound so to exercise it as to discourage the employment of violence to servants, and to uphold in the public mind the sacredness of human life. He exercised it in a manner likely to bring about exactly opposite results, and in so doing became justly obnoxious to your censure.

9. The indiscretion of disposing by summary hearing of an offence which had caused a sacrifice of life was enhanced by the fact that the evidence upon the question of intention was certainly conflicting; while upon the intention depended the question whether the offence was trivial, and falling within the cognisance

cognisance of the magistrate, or a much graver offence, reserved for the superior tribunal. Three witnesses swore that, in addition to the blow with his hand, Mr. Fuller kicked his servant in the stomach. One witness "made no mention" of this circumstance, and the accused denied it. If the three witnesses were correct, there can be little doubt that Mr. Fuller was guilty of a more serious offence, which Mr. Leeds had no authority to dispose of summarily. Mr. Leeds believed the accused, supported by the silence of one witness, and disbelieved the three who testified against him. Some of the reasons he gives for this view are certainly open to serious criticism; yet it is quite possible he may have been right as to the facts. But this conflict of evidence very much adds to Mr. Leeds' responsibility in deciding, as he practically did, that the Superior Court could not have convicted Mr. Fuller of the graver crime.

10. The fatal consequence of Mr. Fuller's violence did not, according to Indian law, increase its criminal character; but it did increase most materially the importance of ascertaining the exact nature of the crime committed, not only accurately, but in such a manner that the accuracy of the decision should be generally recognised. When death has been caused, it is of the utmost importance to satisfy the community that impartial justice has been done, and this necessity is specially urgent where the deceased is dependent and helpless, and the person causing death belongs to a superior class of society. In Western countries public feeling has been dangerously moved in such instances by the suspicion that an undue leniency was likely to be exercised on account of the difference in position between the deceased and the accused. Perhaps no such danger is to be apprehended in India; but the duty is not less imperious of guarding against a misconception which would be dishonouring to the law and would diminish the security of life.

11. It was, doubtless, not without pain that your Excellency inflicted a censure upon an officer to whose general conduct so many high authorities have borne favourable testimony. I do not doubt that you gave, and will continue to give, full weight to such important recommendations. But I am of opinion that the inadequate condemnation of misconduct such as that of which Mr. Fuller was guilty is likely, especially in India, to be attended with great public mischief, and therefore I think that you were fully justified in severely noticing Mr. Leeds' treatment of the case.

12. In conclusion, I must express my conviction that, in your course throughout this difficult case, your Excellency has been guided by an anxious care for the more helpless classes under your rule, and have to assure you of the warm sympathy of Her Majesty's Government with the feelings by which your conduct has been inspired.

I have, &c.
(signed) *Salisbury.*

(Judicial, No. 6.)

To His Excellency The Right Honourable The Governor General of India
in Council.

My Lord, *India Office, London, 22 March 1877.*

Para. 1. I HAVE made some observations in Despatch No. 5, of this day's date, upon your Excellency's orders in regards to Mr. Leeds, so far as they concerned the conduct of that magistrate.

2. Before any notice of it was taken by your Government, your predecessor had directed the attention of the Government of the North West Provinces to the case. Under the Indian Law, the High Court possesses the power of their own motion of calling up and re-hearing criminal causes disposed of by the subordinate Courts, and, if need be, of revising their sentences. Having regard to this power, the Government of the North West passed on the inquiry of your predecessor to the High Court, and received from them a reply, stating that "the sentence, though perhaps lighter than the High Court would have been disposed to inflict under the circumstances, did not appear to be specially open

“to objection.” In reference to this reply, your Excellency observes, “the Governor General in Council cannot but regret that the High Court should have considered that its duties and responsibilities in this matter were adequately fulfilled by the expression of such an opinion.”

3. The High Court conceived that in this passage of your Secretary's letter, as well as in the censure passed upon Mr. Leeds, your Excellency had exceeded your province, and dealt with matters which were not within your competence. The Court, in expressing this opinion, further requested that, in case you should feel yourself unable to accede to their view, the points raised by them should be referred for my consideration and orders.

4. I have carefully considered in Council the matters so referred to me, and have now to make the following observations upon them. The judges of the High Court, in discussing the action of the Executive Government, rely partly upon the language of the Act and Letters Patent by which the High Court has been established, partly upon the independence of the Executive, which, according to the general intention of English legislation, is accorded to Courts of Justice. The Chief Justice, in a separate Minute, holds similar, though stronger language.

5. The material question raised is, whether your Excellency, in the measures you have taken, has exceeded the province which, either by law or by practice, has been assigned to the Executive Government. In considering this point, it is material to bear in mind that some of the functions exercised by the High Courts in India are, according to the practice of this country, strictly executive functions. The supervision of the subordinate Courts, so far as any means exist of exercising it at all, is here confided to officers who form a portion of the Executive Government, and, in respect to the tenure of their office, possess no judicial independence. Unpaid magistrates who misconduct themselves are reprov'd, or, if need be, removed by the Lord Chancellor. In the case of stipendiary magistrates, a similar duty devolves upon the Home Secretary. The review of the decisions of subordinate tribunals belongs, of course, to superior Courts; but the action by which they are submitted to the consideration of a superior Court, so far as it is exercised by any public authority at all, is initiated by the Attorney General or at the instance of an Executive Department.

6. In this case, therefore, it appears to me that the question of the relations between the Judicial and Executive authorities is not in reality raised. In censuring Mr. Leeds, and in expressing your regret that the authority responsible for doing so did not bring his proceedings under judicial review, your Excellency was dealing with purely executive functions, which it is your special province to control. The fact that these functions are, by an exceptional arrangement, partially committed to the High Court does not, in my judgment, alter their executive character, or withdraw them from the superintendence of the Executive Government.

7. The peculiar character of the duties, however, in respect to which your opinion was expressed, has escaped the notice of the judges of the High Court, and they have conceived themselves bound to raise the much wider question whether, and how far, the mode in which their judicial duties is performed is a proper subject for the animadversion of the Government of India. The question is not in my view raised by these papers. It is, therefore, now, and I trust will long remain, purely speculative. If, therefore, the judges had not distinctly requested my opinion on the point, I should have preferred to reserve the consideration of it till the necessity for a decision practically arose.

8. The question the judges of the High Court have, however, formally submitted for my decision, is whether “they are subject to the executive authority of your Excellency in Council, further than is declared by the Letters Patent, and whether it is in the province of your Excellency in Council, in a published Resolution, to approve or condemn the action of the Court in any matter which falls clearly within the functions committed to that Court.” The Chief Justice, in the Minute appended by him to the letter of the High Court, lays down in support of this view, “that the Indian High Courts enjoy the independent authority and prestige of the English Courts.”

9. It

9. It seems to me that in this contention the vital difference between the tenure of English and Indian judges is overlooked. Until the Act of Settlement all English judges held their office, as Indian judges do now, during Her Majesty's pleasure. When Parliament desired to assure their independence and to withdraw them from the authority of the Executive, it enacted that their Commissions should be made "during good behaviour." But when Parliament set up the existing High Courts of India in the year 1861, it did not think fit to adopt towards them the same policy which had been adopted and maintained towards the Courts in England. On the contrary, it was specially enacted that the judges in all the Courts established under the Act of 1861 should "hold their offices during Her Majesty's pleasure."

10. It appears to Her Majesty's Government impossible to treat this difference, deliberately established between the Indian and the English Courts, as accidental and inoperative. In withholding from the Indian judges the independence of the Executive, which had been on a solemn occasion formally conferred upon the English judges, Parliament must be taken to have fully intended the consequences of the important distinction which it was sanctioning.

11. The right to dismiss any person holding an office carries necessarily with it a right to indicate the conduct which may, if persisted in, incur dismissal. In other words, it involves the right to approve or condemn the action of the officer who is so liable to be dismissed.

12. I gather from some phrases used by the Court, and in his Minute by the Chief Justice, that a distinction is drawn in their minds between the powers vested in Her Majesty, and those vested in your Excellency. This distinction may be sustained when applied to any act of a formal character. A judge might obviously decline to accept his dismissal from your Excellency alone, and might ask to be assured that Her Majesty's pleasure had been taken; but in any case it could be only through you that such an intimation could be conveyed. The expression of approval or disapproval on Her Majesty's behalf to Her servants who hold office at Her pleasure, is one of the most important functions with which you are charged. You fulfil it in conformity with your instructions and subject to your responsibility to the Crown. But it does not appear to me that any person holding Her Majesty's Commission can claim to be informed of Her pleasure in any more direct or authoritative way than by a communication from the Viceroy.

13. This appears to me to be in strict right the relation subsisting between your Government and the judges in India. But it is not necessary for me to state to you that, as a matter of policy, any executive action trenching on the independence of judges in the exercise of their purely judicial functions, could only be justified by reasons of extreme necessity. Your Excellency is as deeply impressed as Her Majesty's Government with the importance of maintaining intact that confidence in the impartiality of the law Courts which any interference of the Executive, except under pressure of such reasons, would destroy.

I have, &c.
(signed) *Salisbury.*

EAST INDIA (MR. FULLER AND
MR. LEEDS).

COPIES of all CORRESPONDENCE relating to the
Case of Mr. *Fuller* and the Case of Mr. *Leeds*;
and, of the OPINIONS and DISSENTS of any of
the Members of the Indian Council.

(*Mr. Lowe.*)

Ordered, by The House of Commons, to be Printed,
24 April 1877.

173.

Under 3 oz.

KIRWEE BOOTY.

375

RETURN to an Order of the Honourable The House of Commons,
dated 26 July 1877;—for,

COPY “of a PROTEST, dated 29th day of June 1877, addressed to the SECRETARY to the TREASURY for SUBMISSION to the GOVERNMENT DEPARTMENTS concerned, by Major General COLIN MACKENZIE, C.B., on the Part of CLAIMANTS to the undistributed Portion of the KIRWEE BOOTY.”

Treasury Chambers, }
3 August 1877. }

W. H. SMITH.

9, Bina Gardens, South Kensington, S.W.,

Sir,

29 June 1877.

As President of the Select Prize Committee for the Kirwee Booty, nominated by repeated elections, and duly empowered (as the various proceedings at the Treasury and Privy Council amply demonstrate) to represent the general body of the grantees, I have the honour to submit for the consideration of the Prime Minister and the Lords Commissioners of Her Majesty's Treasury the following protest against the arbitrary seizure of prize funds, the property of the troops, which appears to have been recently sanctioned by the Secretary of State for India in Council.

I am informed that an official notice has been issued, stating that there will be no further distribution of the Kirwee Prize Funds, and that there are no longer any assets or proceeds of the Kirwee spoil in the hands of the Local Government, *i.e.*, in other words, that “the residue of the funds belonging to “the ex-chiefs of Kirwee,” spoken of in a letter of 3rd April last from the Privy Council to my address, is to be diverted from the gracious purpose to which, according to the obvious meaning of the Royal Grant, as interpreted by Mr. (now Vice-Chancellor) Charles Hall, Dr. Tristram, and other jurists, Her Majesty's munificence had awarded it. A copy of this legal opinion is enclosed for reference.

My information is only derived from the public papers; for although the Select Prize Committee includes an officer duly elected, and delegated by power of attorney to act in the room of Colonel Brett (the President of the original Prize Committee, and now in New Zealand), no intimation has been officially given to us of a transaction, which, if persisted in, I respectfully contend is contrary to law and a violation of Her Majesty's prerogative.

(Of 1858 appointed
Pro Prize Agents at
the date of the capture.)

It is a proposition so well established as to be beyond controversy, that the Government of India whenever it takes possession of prize property acquired by the operations, solely or jointly, of the Royal troops can only hold it as a steward or bailee for Her Majesty, whose express grant alone—and the Indian Government can in this case produce no such grant—legalises its permanent appropriation.

I beg, therefore, as nominee and representative of the officers concerned in the division of the booty, to be permitted to place in the hands of the Prime Minister

PROTEST:—KIRWEE BOOTY.

Minister and the Lords Commissioners of Her Majesty's Treasury my		solemn protest against the unauthorised abstraction from	
		the soldiers' prize chest of the sums noted in margin,	
		and aggregating, exclusively of sundry claims for interest,	
		297,571 <i>l</i> .	
		If it should be the opinion of their Lordships and of the legal	
		advisers of the Crown, that the funds here specified are not	
		fairly claimable, according to all the judicial precedents, and	
		the legal acceptance of the term booty, as prize of war, I would	
		urge with great respect that the question ought, in common	
		justice, yet to be submitted for judicial investigation under the	
		Act (3 & 4 Vict. c. 65, sect. 22) specially framed for such purposes, unless the	
		Lords Commissioners, in the exercise of a sound discretion, should think proper	
		to advise Her Majesty to issue such directions for an equitable adjustment of the	
		valid claims of Her troops as may remove all just ground for dissatisfaction and	
		reasonable complaint.	
		I have, &c.	
		(signed) <i>Colin Mackenzie</i> , Major General, C.B.,	
		President of Select Prize Committee,	
		S. and N. F. Force.	
		To the Secretary to the Treasury.	

N.B.—All these items are omitted in the Return, No. 89 (Lords) of 1876, moved for by Lord Cairns, and purporting to be a true Return of all funds belonging to the ex-chiefs of Kirwee.

£. 297,571

I have, &c.

(signed) *Colin Mackenzie*, Major General, C.B.,
President of Select Prize Committee,
S. and N. F. Force.

To the Secretary to the Treasury.

KIRWEE BOOTY.

COPY of a PROTEST, dated 29th June 1877, addressed to the Secretary to the Treasury for Submission to the Government Departments concerned, by Major General *Colin Mackenzie*, C.B., on the Part of CLAIMANTS to the undistributed Portion of the KIRWEE BOOTY.

(*Sir John Hay.*)

Ordered, by The House of Commons, to be Printed,
4 August 1877.

EAST INDIA (LOANS RAISED IN ENGLAND).

RETURN of all LOANS raised in *England* under the Provisions of any Acts of Parliament, chargeable on the REVENUES of *India*, outstanding at the Commencement of the Half-year ending on the 30th September 1876, with the Rates of Interest payable thereon, and the Date of the Termination of each Loan, the Debt incurred during the Half-year, the Moneys raised thereby during the Half-year, the Loans paid off or discharged during the Half-year, and the Loans outstanding at the Close of the Half-year, stating, so far as the public convenience will allow, the purpose or service for which Moneys have been raised during the Half-year.

DESCRIPTION OF LOAN.	RATE OF INTEREST.	DATE OF TERMINATION OF LOAN.	Amount of Debt outstanding on 1 April 1876.	Amount of Debt incurred during the Half-year ended 30 September 1876.	*Moneys raised during the Half-year ended 30 September 1876.	Amount of Debt paid off or discharged during the Half-year ended 30 September 1876.	Amount of Debt outstanding on 30 September 1876.
LOANS BEARING INTEREST.							
East India Bonds	- - - - 4 per cent.	At any time after 12 calendar months' notice.	£. 3,996,700	£. 500,000	£. 500,000	£. 500,000	£. 3,996,700
India Debentures	- - - - 4 per cent.	16th August 1878	7,000,000	100,000	100,904	- - -	7,100,000
India 5 per Cent. Stock	- - - - 5 per cent.	Not redeemable until 5th July 1880, but after that day upon one year's notice by the Secretary of State for India in Council.	17,200,000	- - -	- - -	- - -	17,200,000
India 4 per Cent. Stock	- - - - 4 per cent.	Not redeemable until 10th October 1888, but after that day upon one year's notice by the Secretary of State for India in Council.	21,579,416	4,000,000	4,086,231	- - -	25,579,416
LOANS NOT BEARING INTEREST.							
East India Bonds	- - - -	TOTAL DEBT in ENGLAND, } £. bearing Interest - - - }	49,776,116	4,600,000	- - -	500,000	53,876,116
	- - - -	On presentation of the Bonds	20,917	- - -	- - -	- - -	20,917
	- - - -	TOTAL DEBT in ENGLAND, } £. not bearing Interest - - - }	20,917	- - -	- - -	- - -	20,917
	- - - -	TOTAL DEBT in ENGLAND - £.	49,797,033	- - -	- - -	- - -	53,897,033

* The state of the exchanges between England and India and the requirements of the Indian Government rendered it necessary to raise these sums.

T. W. Keith, Accountant.

India Office,
2 October 1876.

George Hamilton,
Under Secretary of State.

377

EAST INDIA (LOANS RAISED IN ENGLAND).

RETURN of all LOANS raised in *England* under the Provisions of any Acts of Parliament, chargeable on the REVENUES of *India*, outstanding at the Commencement of the Half-year ending on the 30th September 1876, with the Rates of Interest payable thereon, and the Date of the Termination of each Loan, the Debt incurred during the Half-year, the Moneys raised thereby during the Half-year, the Loans paid off or discharged during the Half-year, and the Loans outstanding at the Close of the Half-year, stating, so far as the public convenience will allow, the purpose or service for which Moneys have been raised during the Half-year.

(Presented pursuant to Acts 36 Vict. c. 32, and 37 Vict. c. 3.)

*Ordered, by The House of Commons, to be Printed,
14 February 1877.*

EAST INDIA (LOANS RAISED IN ENGLAND).

154

RETURN of all LOANS raised in *England* under the Provisions of any Acts of Parliament, chargeable on the REVENUES of *India*, outstanding at the Commencement of the Half-year ending on the 31st March 1877, with the Rates of Interest payable thereon, and the Date of the Termination of each Loan, the Debt incurred during the Half-year, the Moneys raised thereby during the Half-year, the Loans paid off or discharged during the Half-year, and the Loans outstanding at the Close of the Half-year, stating, so far as the public convenience will allow, the Purpose or Service for which Moneys have been raised during the Half-year.

DESCRIPTION OF LOAN.	RATE OF INTEREST.	DATE OF TERMINATION OF LOAN.	Amount of Debt outstanding on 1 October 1876.	Amount of Debt incurred during the Half-year ended 31 March 1877.	Moneys raised during the Half-year ended 31 March 1877.	Amount of Debt paid off or discharged during the Half-year ended 31 March 1877.	Amount of Debt outstanding on 31 March 1877.
LOANS BEARING INTEREST.							
East India Bonds	- - - 4 per cent.	At any time after 12 calendar months' notice.	£. 3,996,700	£. 1,500,000	*1,529,625	£. -	£. 5,496,700
India Debentures	- - - 4 per cent.	16th August 1878	7,100,000	-	-	-	7,100,000
India 5 per Cent. Stock	- - - 5 per cent.	Not redeemable until 5th July 1880, but after that day upon one year's notice by the Secretary of State for India in Council.	17,200,000	-	-	-	17,200,000
India 4 per Cent. Stock	- - - 4 per cent.	Not redeemable until 10th October 1888, but after that day upon one year's notice by the Secretary of State for India in Council.	25,579,416	-	-	-	25,579,416
LOANS NOT BEARING INTEREST.							
East India Bonds	- - -	TOTAL DEBT IN ENGLAND, } £. bearing Interest - }	53,876,116	1,500,000	-	-	55,376,116
	- - -	On presentation of the Bonds	20,917	-	-	-	20,917
	- - -	TOTAL DEBT IN ENGLAND, } £. not bearing Interest - }	20,917	-	-	-	20,917
	- - -	TOTAL DEBT IN ENGLAND - £.	53,897,033	-	-	-	55,397,033

* Towards meeting the Expenditure incurred in relief of the Famine in Madras and Bombay.

T. W. Keith, Accountant.

India Office,
2 April 1877. }

George Hamilton,
Under Secretary of State.

379

EAST INDIA (LOANS RAISED IN ENGLAND).

RETURN of all Loans raised in *England* under the Provisions of any Acts of Parliament, chargeable on the REVENUES of *India*, outstanding at the Commencement of the Half-year ending on the 31st March 1877, with the Rates of Interest payable thereon, and the Date of the Termination of each Loan, the Debt incurred during the Half-year, the Moneys raised thereby during the Half-year, the Loans paid off or discharged during the Half-year, and the Loans outstanding at the Close of the Half-year, stating, so far as the public convenience will allow, the Purpose or Service for which Moneys have been raised during the Half-year.

(*Presented pursuant to Acts 36 Vict. c. 32, and 37 Vict. c. 3.*)

*Ordered, by The House of Commons, to be Printed,
12 April 1877.*

RETURN of all LOANS raised in India chargeable on the REVENUES of India, outstanding at the Commencement of the Half-year ending on the 30th September 1876, with the Rates of Interest payable thereon, and the Date of the Termination of each Loan, the Debt incurred during the Half-year, the Moneys raised thereby during the Half-year, the Loans paid off or discharged during the Half-year, and the Loans outstanding at the Close of the Half-year, stating, so far as the Public Convenience will allow, the Purpose or Service for which Moneys have been raised during the Half-year.

DESCRIPTION OF LOAN.	RATE OF INTEREST.	DATE OF TERMINATION OF LOAN.	Amount of Debt outstanding on 1 April 1876.	Amount of Debt incurred during the Half-year ended 30 September 1876.	Moneys raised during the Half-year ended 30 September 1876.	TOTAL.	Amount of Debt paid off or discharged during the Half-year ended 30 September 1876.	Amount of Debt outstanding on 30 September 1876.
LOANS BEARING INTEREST.								
5½ per Cent. Loan of 1859-60 -	5½ per cent.	Not before 1 May 1879 -	10,201,670	-	-	10,201,670	-	10,201,670
4½ per Cent. Transfer Loan of 1870 -	4½ per cent.	Not before 15 July 1885 -	1,835,790	-	-	1,835,790	-	1,835,790
4½ per Cent. Transfer Loan of 1871 -	4½ per cent.	Not before 4 July 1881; falls to 4 per cent. on that date.	221,900	-	-	221,900	-	221,900
4½ per Cent. Transfer Loan of 1872 -	4½ per cent.	Not before 16 January 1882; falls to 4 per cent. on 16 January 1879.	13,079,130	850	-	13,079,980	-	13,079,980
4 per Cent. Loan of 1824-25 -	4 per cent.	3 months after notice by Government	31,808	-	-	31,808	-	31,808
4 per Cent. Loan of 1828-29 -	4 per cent.	ditto	10,730	-	-	10,730	331	10,399
4 per Cent. Loan of 1832-33 -	4 per cent.	ditto	1,250,006	-	-	1,250,006	20,693	1,229,313
4 per Cent. Loan of 1835-36 -	4 per cent.	ditto	3,144,790	-	-	3,144,790	26,870	3,117,920
4 per Cent. Loan of 1842-43 -	4 per cent.	ditto	14,472,630	23,200	-	14,495,830	28,520	14,467,310
4 per Cent. Loan of 1854-55 -	4 per cent.	ditto	6,613,720	-	-	6,613,720	53,300	6,538,420
4 per Cent. Transfer Loan of 1 May 1865	4 per cent.	ditto	17,300,752	133,060	40	17,433,812	8,370	17,425,442
4 per Cent. Transfer Loan of 22 April 1854	4 per cent.	15 months after notice by Government	*1,238,439	-	-	1,238,439	7,773	*1,230,666
3½ per Cent. Loan of 1853-54 -	3½ per cent.	3 months after notice by Government	65,200	-	-	65,200	-	65,200
4½ per Cent. Loan for Indore State Railway	4½ per cent.	-	890,000	55,000	55,000	945,000	-	945,000
5 per Cent. Debenture Loan of 1867-68 -	5 per cent.	{ Rs. 49,56,000 on 1 June 1877 - Rs. 60,03,000 on 1 June 1882 - }	1,095,900	-	-	1,095,900	-	1,095,900
4 per Cent. Promissory Notes for Mysore Family	4 per cent.	-	253,176	-	-	253,176	9,830	243,296
4 per Cent. Loan from Maharajah Scindia for State Railway	4 per cent.	-	1,000,000	213,627	-	1,213,627	-	1,213,627
TOTAL DEBT IN INDIA } £. drawing Interest			72,705,641	425,737	268,637	73,131,378	157,737	72,973,641
LOANS NOT BEARING INTEREST.								
5 per Cent. Loan of 1856-57 -	5 per cent.	-	41,880	50	-	41,930	8,000	33,930
5 per Cent. Loan of 1825-26 -	5 per cent.	-	6,240	-	-	6,240	-	6,240
5 per Cent. Loan of 1841-42 -	5 per cent.	Already advertised for payment	1,590	-	-	1,590	-	1,590
5 per Cent. Loan of 1854-55 for Public Works	5 per cent.	-	8,350	-	-	8,350	1,000	7,350
Treasury Bills at 2½ pie per cent. per diem	-	-	9,280	-	-	9,280	-	9,280
TOTAL DEBT IN INDIA } £. not bearing Interest -			67,340	50	-	67,390	9,000	58,390
TOTAL DEBT IN INDIA - £.			72,772,981	425,787	268,637	73,198,768	166,737	73,032,031

* Includes amount held in England.

Comptroller General's Office, Calcutta,
13 January 1877.

E. F. Harrison, Comptroller General.

George Hamilton,
Under Secretary of State.

EAST INDIA (LOANS RAISED IN INDIA).

RETURN of all Loans raised in *India* chargeable on the REVENUES of *India*, outstanding at the Commencement of the Half-year ending on the 30th September 1876, with the Rates of Interest payable thereon, and the Date of the Termination of each Loan, the Debt incurred during the Half-year, the Moneys raised thereby during the Half-year, the Loans paid off or discharged during the Half-year, and the Loans outstanding at the Close of the Half-year, stating, so far as the Public Convenience will allow, the Purpose or Service for which Moneys have been raised during the Half-year.

(Presented pursuant to Acts 36 Vict. c. 32,
and 37 Vict. c. 3.)

*Ordered, by The House of Commons, to be Printed,
14 February 1877.*

RETURN of all LOANS raised in India chargeable on the REVENUES of India, outstanding at the Commencement of the Half-year ending on the 31st March 1877, with the Rates of Interest payable thereon, and the Date of the Termination of each Loan, the Debt incurred during the Half-year, the Moneys raised thereby during the Half-year, the Loans paid off or discharged during the Half-year, and the Loans outstanding at the Close of the Half-year, stating, so far as the Public Convenience will allow, the Purpose or Service for which Moneys have been raised during the Half-year.

DESCRIPTION OF LOAN.	RATE OF INTEREST.	DATE OF TERMINATION OF LOAN.	Amount of Debt outstanding on 1 October 1876.	Amount of Debt incurred during the Half-year ended 31 March 1877.	Moneys raised during the Half-year ended 31 March 1877.	TOTAL.	Amount of Debt paid off or discharged during the Half-year ended 31 March 1877.	Amount of Debt outstanding on 31 March 1877.
LOANS BEARING INTEREST.								
5½ per Cent. Loan of 1859-60 -	5½ per cent.	Not before 1 May 1879 -	10,301,670	-	-	10,201,670	366,500	9,845,170
4½ per Cent. Transfer Loan of 1870 -	4½ per cent.	Not before 15 July 1885 -	1,835,790	-	-	1,835,790	-	1,835,790
4½ per Cent. Transfer Loan of 1871 -	4½ per cent.	Not before 4 July 1881; falls to 4 per cent. on that date.	221,900	-	-	221,900	-	221,900
4½ per Cent. Transfer Loan of 1872 -	4½ per cent.	Not before 16 January 1882; falls to 4 per cent. on 16 January 1879.	13,079,980	50	-	13,080,030	688,000	12,392,030
4 per Cent. Loan of 1824-25 -	4 per cent.	3 months after notice by Government	31,808	-	-	31,808	-	31,808
4 per Cent. Loan of 1828-29 -	4 per cent.	ditto	10,399	-	-	10,399	53	10,346
4 per Cent. Loan of 1832-33 -	4 per cent.	ditto	1,929,313	-	-	1,229,313	1,942	1,227,371
4 per Cent. Loan of 1835-36 -	4 per cent.	ditto	3,117,920	-	-	3,117,920	48,200	3,069,720
4 per Cent. Loan of 1842-43 -	4 per cent.	ditto	14,467,310	45,250	-	14,512,560	103,780	14,408,780
4 per Cent. Loan of 1854-55 -	4 per cent.	ditto	6,558,430	80	-	6,558,500	62,940	6,495,560
4 per Cent. Transfer Loan of 1 May 1865	4 per cent.	ditto	17,425,142	124,838	4	17,550,280	119,020	17,431,260
4 per Cent. Transfer Loan of 22 April 1854	4 per cent.	15 months after notice by Government	*1,230,666	-	-	1,230,666	-	*1,230,666
3½ per Cent. Loan of 1853-54 -	3½ per cent.	3 months after notice by Government	65,200	-	-	65,200	-	65,200
4½ per Cent. Loan for Indore State Railway	4½ per cent.	-	945,000	55,000	55,000	1,000,000	-	1,000,000
5 per Cent. Debenture Loan of 1867-68 -	5 per cent.	(Rs. 45,81,000 on 1 June 1877 - Rs. 60,63,000 on 1 June 1882 -	1,095,900	-	-	1,095,900	37,500	1,058,400
4 per Cent. Promissory Notes for Mysore Family	4 per cent.	-	243,296	-	-	243,296	6,927	236,369
4 per Cent. Loan from Maharajah Scindia for State Railway	4 per cent.	-	1,213,627	91,939	-	1,305,566	-	1,305,566
TOTAL DEBT IN INDIA - £.			72,973,641	317,157	146,943	73,290,798	1,424,862	71,865,936
LOANS NOT BEARING INTEREST.								
5 per Cent. Loan of 1856-57 -	5 per cent.	-	33,930	-	-	33,930	650	33,280
5 per Cent. Loan of 1826-26 -	5 per cent.	-	6,240	-	-	6,240	-	6,240
5 per Cent. Loan of 1841-42 -	5 per cent.	Already advertised for payment	1,590	-	-	1,590	-	1,590
5 per Cent. Loan of 1854-55 for Public Works	5 per cent.	-	7,350	-	-	7,350	550	6,800
Treasury Bills at 2½ pie per cent. per diem	-	-	9,280	-	-	9,280	-	9,280
TOTAL DEBT IN INDIA - £.			58,390	-	-	58,390	1,200	57,190
TOTAL DEBT IN INDIA - £.			73,032,031	317,157	146,943	73,349,188	1,426,062	71,923,126

* Includes amount held in England.

Comptroller General's Office, Calcutta,
18 May 1877.

W. Waterfield, Officiating Comptroller General.

George Hamilton,
Under Secretary of State.

EAST INDIA (LOANS RAISED IN INDIA).

RETURN of all Loans raised in *India* chargeable on the REVENUES of *India*, outstanding at the Commencement of the Half-year ending on the 31st March 1877, with the Rates of Interest payable thereon, and the Date of the Termination of each Loan, the Debt incurred during the Half-year, the Moneys raised thereby during the Half-year, the Loans paid off or discharged during the Half-year, and the Loans outstanding at the Close of the Half-year, stating, so far as the Public Convenience will allow, the Purpose or Service for which Moneys have been raised during the Half-year.

(*Presented pursuant to Acts 36 Vict. c. 32,
and 37 Vict. c. 3.*)

*Ordered, by The House of Commons, to be Printed,
2 July 1877.*

EAST INDIA (MARINE SURVEY).

RETURN to an Address of the Honourable The House of Commons.
dated 19 March 1877;—for,

“COPY of the GENERAL REPORT of the Operations of the MARINE SURVEY
of INDIA, from the commencement in 1874 to the end of the Official
Year 1875-6, made under the directions of Commander *A. Dundas Taylor*,
Calcutta, 1876.”

India Office, }
21 March 1877. }

GEORGE HAMILTON,
Under Secretary of State.

(*Sir John Hay.*)

Ordered, by The House of Commons, to be Printed,
21 March 1877.

TABLE OF CONTENTS.

Section I.—General Report—

	PAGE.
Attention drawn to pressing necessity for New Surveys in India	3
Sanction of Secretary of State	5
Appointment of Admiralty Surveyors	5
Collection of original Documents at the Admiralty	5
Surveying Vessels fitted at Bombay	5
Surveying Vessels fitted at Calcutta	6
Appointments taken up	6
Resolution defining Duties of Department	6
Fitting up and organising Office	7
Questions affecting Navigation	7
Chart Agency	8
Wreck Chart	9
Employment of Vessels during early part of 1875	9
Surveys on and changes in <i>matériel</i>	10
Changes in <i>personnel</i>	10
Operations for 1875-76	10
Parties formed	11
Inspection of Burma Coast	11
Admiralty Charts of Burma Coast	11
More suitable Vessel much required	11
Establishment of Department	12

Section II.—Drawing Branch—

New Coast Series of Charts	13
Charts prepared for Photozincographing	14
Miscellaneous Drawings executed	15
Number of Charts corrected	15
New Publications	15

Section III.—Surveying Operations—

Operation at Kolachel and in the Gulf of Manar	16
Survey of Coconada and Coringa Bay	16
Survey of portion of the River Hooghly	16
Examination of the Reefs of the Laccadive Islands	17
Survey of Approaches to Rangoon River	18 and 19
Meridian distance between Elephant Point and Amherst	20
Reported error in position of Krishna Shoal Lighthouse and of extension of Baragua Flat	20
Dredging between Diamond Island and Akyab	21
Survey of Akyab	21
Examination of Coast between Kyonk-Phyou and Cheduba Island	21
Examination of Kyonk-Phyou Harbour	22
Survey of False Point Anchorage	22
Attempt at Survey of Palmyra's Shoals	22
Natural History Researches	23

APPENDICES.

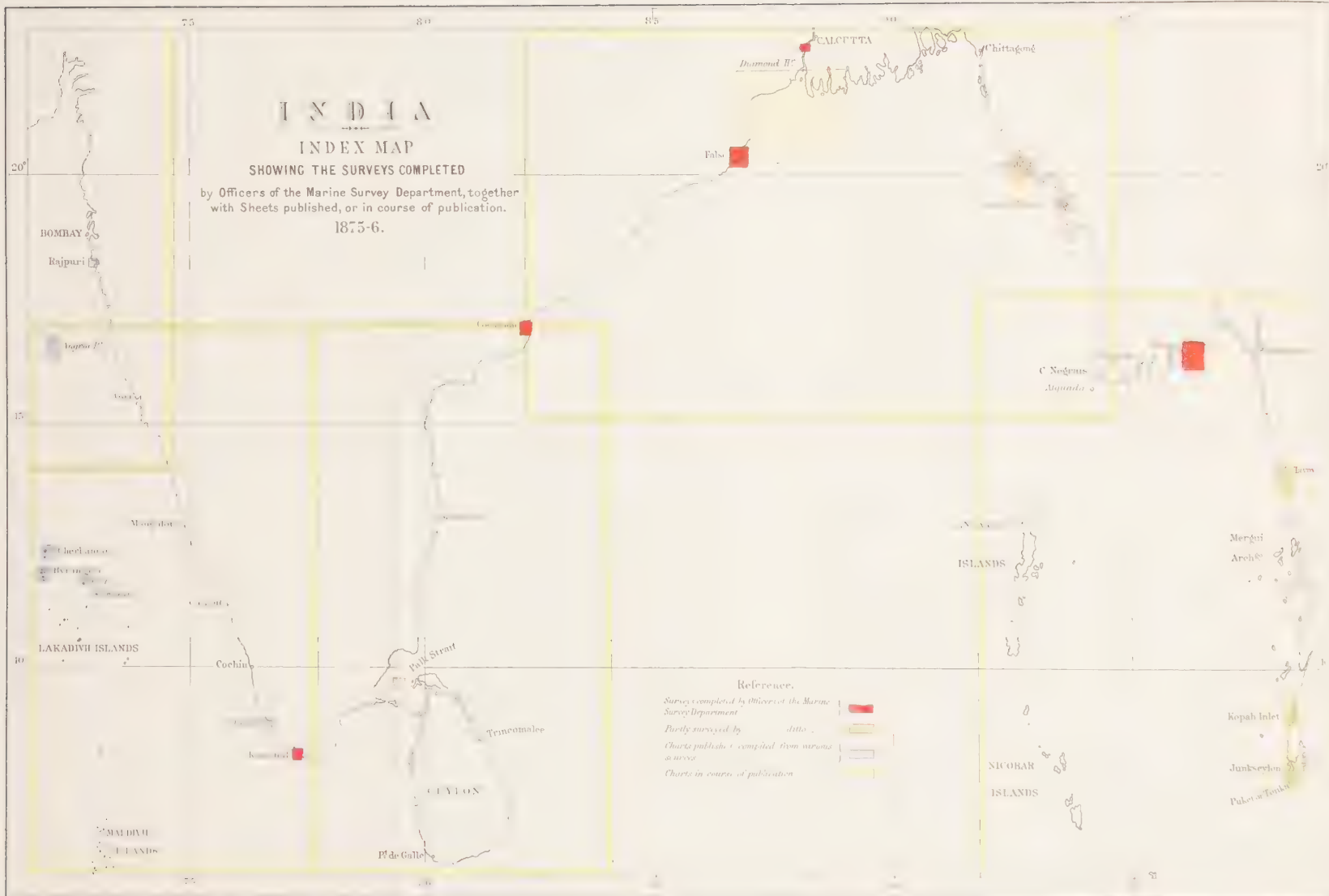
Report on Ports of Burma by Commander A. D. Taylor, Superintendent	24
Report on Surveys needed on West Coast of India	27
Report on the proposed alterations in the Lighting of Cocanada	29
Report on Re-organisation of Hooghly River Survey	30
Proposed alterations in the Lighting and Buoying of Rangoon River	32
Describing Coast between Akyab and Cheduba Island	33
Extracts from Dr. Armstrong's Report on the Natural History Work of the Survey	34
Tabular Synopsis of Observations for Meridian Distance between Elephant Point, Obelisk, Rangoon, and Amherst Point Pagoda	36
Statement of Actual Cost of Marine Survey for 1875-76	37
Programme of Operations for 1876-77	38

INDIA

INDEX MAP

SHOWING THE SURVEYS COMPLETED

by Officers of the Marine Survey Department, together
with Sheets published, or in course of publication.
1875-6.



GENERAL REPORT on the Operations of the MARINE SURVEY of
INDIA, from the commencement in 1874 to the end of the Official Year
1875-76.

SECTION I.

GENERAL REPORT.

As this is the first Annual Report of the operations of the Marine Survey Department, since the sanction for its formation was granted by Her Majesty's Secretary of State for India, on the representation of the Indian Government in 1874, it would, perhaps, be as well if, instead of confining my report solely to the actual surveys which have been executed, and the outturn of work in the Drawing Branch and Office, I should first place on record the steps which were taken towards organising the department from the commencement, and also the ultimate form it assumed, from both necessary and unavoidable changes which occurred during the first year of its working.

1. In 1871, the necessity for improving the existing charts of the Indian coasts, and executing new surveys, owing to the increased development of the ocean and coasting trade of India, and the urgent call for exact knowledge regarding the capabilities of its harbours, became so pressing as to induce Parliament, as well as the public, to turn their attention to the lamentable state of Indian hydrography.

Attention drawn to the pressing necessity for new surveys in India.

2. Since the abolition of the Indian Navy, and the transfer from the India Office to the Admiralty of all the materials for the construction of charts in 1861, up to the year 1871, a period of 10 years, little or nothing had been done, with the exception of certain desultory operations undertaken by the different local governments as the need arose, without any combined plan, with inadequate means, and in most cases the work was left in the hands of persons who were quite unacquainted with nautical surveying, except in its rudest form.

3. Extraordinary changes had taken place in the configuration of the coast, in many localities, since the surveys executed some 30 to 50 years previously. Lights, buoys, beacons, &c., had been erected. Ports which were of no importance then, and the examination of which consequently had been but cursory, had now become open to commerce, and yet the charts remained the same and were practically useless. It was also pointed out that the surveys of half a century, or more, ago were merely preliminary examinations, and could not, in the first instance, without steamboats and trained officers, have been executed in the precise manner in which surveys are now carried out by the Surveyors of the Royal Navy, the rigorous exactitude of which is absolutely necessary for the requirements of the present advanced state of navigation and commerce.

4. The urgent necessity for immediate action was pointed out by Mr. Clements Markham, C.B., F.R.S., in an exhaustive memoir, which was submitted, with other memoranda, by Mr. Trelawney Saunders, Geographer to the India Office, Captain Constable, I.N., myself and others, for the consideration of Her Majesty's Secretary of State for India, the Duke of Argyll. Mr. Markham's official position at the India Office and extensive knowledge of the subjects included under the general head of Geography, eminently qualified him for the task of reviewing the past and present state of Indian hydrography, and

giving valuable suggestions on the necessary steps to be taken to remedy existing evils.

5. In the early part of 1871, the Secretary of State, in a Despatch forwarding the above memoir, &c., brought this important subject to notice, and requested the earliest and serious attention of the Government of India, asking, at the same time, for opinions and suggestions as to the measures to be adopted for providing some efficient substitute for the establishments formerly maintained for the survey of the Indian seas.

6. The Government of India, before giving any decided answer, suggested that I should be sent out to India to assist in devising suitable measures to remedy the inconveniences pointed out. This proposal was approved of by Her Majesty's Secretary of State, and I arrived in Calcutta in December 1873.

7. Under the direction of the Government, I prepared a review of all existing charts, or materials for charts, in India or in England, of the coast from Pakchan Estuary to Sonmiani Bay, as also of the islands in the Bay of Bengal, the Laccadives and Maldives; also, a scheme to supplement and perfect existing charts, both by working up materials, not then utilised, and by new surveys, and fully detailing for each the method in, and the agency by, which it should be carried out, and its probable cost.

8. After full inquiry and consultation with the marine authorities, and others interested in the coasting trade and approaches to our coast and harbours, I submitted a report of the measures which, in my judgment, were required. This report was substantially adopted by the Government of India which accepted the responsibility of completing and maintaining the charts of the Indian coast, from Pakchan Estuary, at the southern extremity of Tenasserim, to Sonmiani Bay, on the western limits of the Sind coast, of the Andaman and Nicobar Islands, the Mergui Archipelago and the Laccadives.

9. Her Majesty's Secretary of State for India was thereupon asked for a special agency,—

1. To undertake accurate surveys of localities not yet sufficiently surveyed.

2. To work up the results of these surveys, and of other existing surveys, the materials of which have never yet been fully utilised.

3. To maintain the accuracy of our charts, by recording and bringing to notice all changes in the first instance of buoys, lights, and the like; and secondly, from time to time, of the natural configuration of the seaboard consequent on natural changes.

10. The proposals of the Government of India were very briefly as follows:—

That, with the view of executing gradually all the more pressing marine surveys and re-surveys, within the limits for which the Indian Government accepted the responsibility, a small survey flotilla should be organised with competent surveyors and efficiently manned, the whole cost of which, including a superintendent of marine surveys, should not exceed two lakhs of rupees per annum.

That, to supervise both the carrying on of the surveys afloat, the draughting of the charts for publication, to superintend the reproduction by photozincography, or their preparation for transmission to the hydrographer, to maintain a correct record of buoys, lights and the like, and publish the earliest information of changes in the position of these, a superintendent of marine surveys should be appointed.

11. It was also proposed that I should return to England, *via* Bombay*, that I might be available to furnish the Secretary of State with any further details which might be necessary, in order to finally arrange for the manner in which the services of officers of the Royal Navy might be secured. During my stay at Bombay, I made it my duty to bring the question of missing original charts before many of the officers who had formerly served the local situations connected

* There I was detained nearly three weeks, being appointed member of a committee under the presidency of Colonel Alexander Fraser, R.E., C.B., to report upon the hydraulic lift at Hog Island.

nected with the dockyard and the Observatory, where the Indian Navy Draughtsman's office was located. The result was that a great number of valuable documents were found at the time; a few of these I took to England and deposited at the India Office; amongst them were original maps of Mesopotamia, which Captain Felix Jones, I.N., found of use in the compilation of his new great map of Arabia. But after securing these, from information received at the storekeeper's office, I reported to the Government of India a contemplated wholesale destruction of some 3,000 old charts, because of their being dust-stained, torn and insect-eaten; my suggestion was (and fortunately it came in time to be carried out) that these charts should be sent to Calcutta to await my return. This proved a real treasure-trove; many invaluable original charts were preserved from destruction, and now are carefully stored at Calcutta and catalogued. Three or four originals, on a large scale, of portions of Captain Moresby's survey of the Red Sea were discovered, copies of which have been forwarded to the Hydrographer.

12. The proposal of the Government of India for the resumption of Marine Surveys, together with the scheme submitted based on my report, preceded me to England, and was there sanctioned by Her Majesty's Secretary of State for India in Council, in a Despatch dated 16th July 1874, and I was appointed Superintendent of Marine Surveys on the 27th July of the same year.

Sanction of Secretary of State.

13. In accordance with the scheme, the Lords Commissioners of the Admiralty were communicated with on the subject of appointing officers of the Surveying Branch of the Royal Navy to fill the superior posts in this department under the Government of India. The proposals met with the approval of their Lordships, and after some further correspondence between the India Office and the Admiralty, settling the necessary details of the conditions under which the services of these officers were to be placed at the disposal of the Indian Government, six navigating officers, viz., one staff commander, three navigating lieutenants, and two navigating sub-lieutenants, were, on the nomination of the Hydrographer of the Admiralty, ultimately selected and appointed. I also informed the Secretary of State that no one in India with scientific training could be found competent to utilise the mass of original documents which had been discovered in England and India, or to undertake the compilation and production of charts ready for publication. Only a person who had had long experience in this particular branch would be of any value, and upon my representations the Secretary of State, with the approval of the Admiralty, appointed Mr. R. C. Carrington, who had served 16 years in the Hydrographic Department, as my Chief Civil Assistant. This title was subsequently altered by the Government of India, with sanction from the Secretary of State (18th May 1875), to "Superintendent of the Drawing Branch."

Appointment of Admiralty Surveyors and Chief Civil Assistant.

14. During the time the negotiations with the Admiralty were going on, my time was devoted to the examination of all the original drawings of the surveys of this country, principally executed by officers of the old Indian Navy, but many of which had hitherto remained unutilised. These were noted for early publication in our new department. I also examined all the existing charts of India, published by the Admiralty, collected the necessary books of reference, instruments, &c. &c., which could not be obtained in India, and a supply of Admiralty charts and sailing directions for transmission to our headquarters at Calcutta, and saw completed and shipped two steam-cutters to be furnished to the vessels of the survey.

Collection and examination of original documents and copper plates at the Admiralty.

15. After settling all the above details I left England on the 23rd December 1874, in company with Staff Commander Ellis, R.N., who had been appointed Deputy Superintendent. Proceeding *via* Brindisi, I arrived at Bombay on the 15th January 1875.

Return to India.

16. The two vessels "Clyde" (steamer), and "Constance" (schooner), which had been fitted in the dockyard at Bombay for surveying service, by order of the Government of India, were nearly ready for sea on my arrival. They were completed with all possible dispatch, and on the 2nd February the "Clyde" under the temporary command of Staff Commander Ellis, R.N., left for the Laccadive Islands *en route* for Calcutta.

Surveying vessels fitted at Bombay.

The "Constance," in temporary charge of Mr. M. Chapman, I.N., who had

commanded this vessel for three years while surveying in the Persian Gulf, under the orders of the Bombay Government, left on the 29th January for Kolachel.

17. Having dispatched these vessels, I proceeded from Bombay by rail to Calcutta, arriving on the 7th February, when I at once commenced to organise my office.

Surveying vessels fitted at Calcutta.

18. Two vessels had been selected to be fitted out by the Kidderpore dockyard authorities for surveying service, viz., the "Guide" (brig) and the "Lady Lawrence" (schooner). On my arrival, I inspected these vessels and found that, though the former had been in the hands of the dockyard since October 1874, very little had been done towards preparing her for surveying service. This may be accounted for principally by the death, in October 1874, of Mr. W. Pearson, Assistant Superintendent, first grade, whose duty it was to have superintended the fitting out of the vessels. After his death, there was no one on the spot who possessed the requisite experience to whom that duty could be delegated. The internal fittings, however, were on my arrival at once commenced, and everything was done to hasten her completion, but she was not out of the hands of the dockyard until 1st April. The "Guide" had been reported by the Marine Department as ready for sea some time previously, and was turned over to this department as equipped and ready for service.

On again looking over the schooner "Lady Lawrence," it became apparent that she could not carry a steam-cutter, and, as her accommodation for chart work was very limited, I considered it unadvisable to fit her for service under this department, and addressed the Government, proposing, on the above grounds, that she should be re-transferred to the Marine Department.

Appointments taken up.

19. On the 20th February 1875, three naval officers, viz., Lieutenants Jarrad and Hammond, and Sub-lieutenant George, together with Mr. R. C. Carrington, arrived and took up their appointments, the remaining naval officers, Navigating Lieutenant Coghlan and Sub-lieutenant Petley, arriving in the course of the following month. Three officers of the Bengal Marine and Hooghly River Survey, respectively, had been previously appointed in India on probation.

Resolution, defining the duties of the Department and ratifying appointments.

20. Pending the opening of the season for active operations at sea, my attention was given to the preparation of a modified scheme, showing what vessels and establishments were exactly required for the department, and the duties which we proposed to undertake. On these proposals the Government of India, after some delay, passed orders on the 25th October 1875. By that Resolution the appointments of the superior officers were formally recognised and notified, a suitable office establishment was sanctioned, and the duties of the department defined as follows:—

(a.) That systematic surveys of the coast of India were to be undertaken in suitable vessels, efficiently equipped and manned. The Superintendent of Marine Surveys acting in concert with the Surveyor General of India, and arranging that the Marine surveys should be connected with those of the Great Trigonometrical Survey.

(b.) The original surveys of ports, harbours, and river entrances when received in the office of the Superintendent, were, after approval, to be photozincographed at the Surveyor General's office; and issued for local navigation and engineering purposes. From these, as well as other surveys of the coast, executed on a smaller scale, charts of the coast were to be compiled on a medium scale for general navigation.

(c.) Copies of all original surveys to be forwarded to the Hydrographer to the Admiralty for publication, on such scales as might be decided on after the consideration of the subject by the Superintendent and Hydrographer. All corrections of surveys and other information connected with them, such as notices of changes in buoys, beacons, lights, &c., to be transmitted at once to the Hydrographer and other naval authorities, to be hereafter arranged.

(d.) The department also to be responsible for maintaining a sufficient stock of the various charts, published by the authority of the Admiralty, and for supplying them to the local governments, officials, or to other persons, in a manner to be arranged hereafter.

(e.) In

(e.) In order to carry out these duties effectually, the local governments and administrations, and the masters attendant at the several ports, were directed to promptly communicate all information regarding wrecks, lights, buoys, beacons, or other matters relating to the navigation to the Superintendent. The Admiral Commanding Her Majesty's Naval Forces on the East India Station was also requested to furnish the department with extracts, bearing on the same subject from the remark books of the officers commanding or navigating any of Her Majesty's ships in Indian waters. The Superintendent of Marine under the Government of Bombay, and the Master Attendant, Bengal, were also instructed to furnish information of a like character, which might be reported by the officers commanding vessels in the Bengal and Bombay Marine. The Superintendent of Marine Surveys was directed to communicate with the Government of India in regard to the lighting and marking of the sea approaches to all great Indian ports and rivers, and to suggest improvements which he might think desirable in harbour conservancy, as well as those required in the navigation of rivers throughout India which might come to his notice, either in the prosecution of the surveys or through local authorities.

(f.) The annual wreck chart to be compiled, an annual list of lights issued, and sailing directions for the Indian coasts, hydrographic notices and notices to mariners.

21. Pending the receipt of these orders, the office was being fitted up with all the necessary equipment peculiar to such an establishment as a Marine Survey Office. Under the able supervision of Mr. Carrington, the drawing branch was soon in working order, although our staff of subordinates was not completed until very lately. The plans for the drawing tables and presses in which to shelve the published charts of each locality as well as original documents were prepared, and both were soon ready. Mr. Carrington at once set about examining and preparing a catalogue of the numerous original documents which had been brought out from the Admiralty, as well as a selection from those (nearly 3,000 in number) which I had rescued from Bombay. He also prepared a separate catalogue of the published Admiralty charts which were arranged in our presses ready for issue.

Fitting up and organising the office.

The necessary duty of establishing an office routine, systematically filing, docketing, and registering correspondence, starting the books in which to check and audit the accounts of the vessels, preparing necessary forms, as well as assisting me in the many reports called for at this early stage by the Government of India, was undertaken by Lieutenant Jarrad. A suitable head clerk was not obtained until November 1875, but the assistant clerk and writers were sufficiently acquainted with their several duties by the end of September to then enable me to relieve Lieutenant Jarrad of these duties.

Mr. Donald Sunder, as head clerk and accountant, since November 1875, has rendered good service in my office, and I cannot speak too highly of his intelligence, assiduity and devotion to his duties.

22. The official correspondence during the year 1875 was rather heavy, considering the small office staff which, during the greater part of the time, consisted only of one clerk and one copyist. The number of official letters, besides lengthy reports issued, amounted to 356, and there were 310 demi-official letters and office memoranda sent out up to the 31st December 1875. The large amount of work at the commencement was consequent on settling and placing all details before the Government prior to the issue of the Resolution, which, in consequence of questions raised by the Military (Marine) Department, and which had previously been considered as settled in England, was delayed until 25th October 1875. In consequence of this protracted delay, the greatest difficulty was experienced in conducting business, as the Accountant General refused to make any payments either to officers or crews of vessels without special sanction of the Government month after month. It thus became necessary to make application for each item of expenditure, and this caused serious inconvenience and entailed much correspondence.

Official correspondence.

23. A large number of nautical questions of a scientific character are from time to time forwarded to me by the Government of India for report. The important nature of some of these subjects, affecting, as they do, so materially the interests of navigators and shipowners, warrants my enumerating the principal

Questions affecting navigation.

principal heads for report as being points to which my attention, as well as that of Staff Commander Ellis, has been particularly directed, and the careful consideration of which has occupied a considerable portion of my time.

The most important subjects are as follows :—

- | | | |
|--------------|---|---|
| Lights - - - | { | Necessity for a light on Cape Guardafui. |
| | | " " Cape Comorin. |
| | | " " Muttum Point. |
| | | " " Minicoy Island. |
| | | Necessity for removal of Coringa (Hope Island) light to a more suitable position. |
| | | The best means of efficiently lighting Cocanada port. |
| | | Lighting the River Hughli. |
| | | Removal or retention of Mutlah light. |
| | | Lights on coast of Burma. |

Buoyage and re-survey of Bombay Harbourn.

Re-organisation of River Hughli Survey.

Re-organisation of River Hughli Pilot Service.

Establishment of a permanent Board for the examination of seamanship and of navigation of masters and mates in the mercantile marine.

The necessity for coolie ships calling at St. Helena and the Cape.

Native Passenger Act of 1876 with reference to long and short voyages, and seasons of fair and foul weather.

Measurements for tonnage of vessels.

Rules affecting emigrant ships. (For the better provision against fire.)

Survey on unseaworthy ships. (Home Regulations.)

I was also directed to prepare an elaborate tabular statement showing the cost of erection and maintenance of all the lighthouses and light vessels of British India, together with their positions, distinctive characteristics, &c. This duty was assigned to Staff Commander Ellis; the difficulty of getting accurate information has been most astonishing, and has much delayed the completion of this important work.

Chart Agency.

24. Under the orders of the Government of India, the question of the supply of charts corrected to latest date to Government vessels, marine authorities or other officials requiring them, as also the means of establishing a chart agency where *correct* charts and sailing directions could be purchased by the mercantile marine or others, was fully considered; the necessary forms were prepared to be forwarded to the authorities with whom charts were at present deposited, to enable me to form an idea of the number and date of last correction of those in hand, and also the probable number wanted to meet immediate requirements; and I submitted a proposal to the Government, which, if carried out, will secure the supply of charts containing the latest information to Government officials, and also prevent the nautical public being subjected to the necessity of paying extravagant prices in the bazars for obsolete charts, or being supplied by the Marine authorities with the same description of chart, from a stock which has been allowed to accumulate for years without correction.

25. The proposal (commended by the Department of Commerce) which knew well the local exigencies of India, as indicated by inquiries into many a wreck) was sanctioned by the Government of India, but the Admiralty (presumably at the instance of their hydrographer) have lately expressed their dissent generally to any chart office being established in Calcutta.

26. This is much to be regretted, as it has delayed the execution of this most important duty of our department, the Admiralty having withheld the charts which were demanded to meet the requirements of India. The subject, however, I trust will be placed before their Lordships in such a light as to convince them of the urgent necessity to reform the method hitherto pursued, and which has proved so disastrous in India.

27. A depôt for the sale of charts in Calcutta, under the control of this department, will ensure the latest editions being at all times procurable. The want of this is daily felt, and numerous applications are made for charts, sailing directions, &c., which have been met, as far as our limited stock would permit

us.

us. Amongst these applications I may mention that large demands from the Admiral Commanding Her Majesty's Flying Squadron proceeding to China and Her Majesty's troop-ship "Himalaya" were complied with.

28. All arrangements have been made for the correction, supply, and sale of the charts, and we only now await their Lordships' consent to supplying us with a sufficient number of copies, the originals of which were executed by Indian surveyors, paid for from Indian revenues, and the copper-plates of which, though stored at the Admiralty, are the property of the Indian Government.

29. The wreck chart, showing the position of wrecks and casualties which occur during the year in Indian waters will, after the 1st April 1876, be prepared in the drawing branch, as well as a detailed statement and review. All the correspondence necessary for gathering every particular of accidents and disasters to shipping, as well as the issue of notices of the same to the Board of Trade, other authorities and public prints, is now carried on in that branch of this department. Wreck chart.

30. The season had so far advanced on the arrival of the officers and the completion of the vessels, as not to admit of any extensive operation being commenced. Most of the officers were ordered to rendezvous at Calcutta, so that the "Clyde" and "Constance" at Bombay could not be dispatched with an efficient staff. Under these circumstances, the work allotted to each was of necessity limited to the time and means at the disposal of the officer in command. Employment of vessels during the early part of 1875.

31. Staff Commander Ellis in the "Clyde" was instructed to render every assistance to Mr. A. O. Hume, C.B., Secretary to the Government of India, in the Department of Revenue, Agriculture, and Commerce, who took a passage on board for the purpose of visiting various proposed sites for lighthouses. A visit to Minikoy was originally contemplated, but it was doubtful whether the "Clyde" could carry coal enough to bring her back from that island against the N. E. monsoon. Leaving the coast of India about Pigeon or Hog Island, he was to measure a meridian distance to one of the islands of the Laccadive group, among which he was to remain about a fortnight, testing the accuracy of the existing charts, and making any necessary additions to them. Leaving the Laccadives, Staff Commander Ellis was to proceed to Paumben to meet the "Constance," and passing through the Paumben Pass to examine the anchorage, and also test the soundings between the Shingle Islets and Ramesaram, after which he was to leave for Calcutta by the 10th March. The "Clyde."

32. Mr. Chapman in the "Constance" (*see* para. 16) was first to proceed to Kolachel to make a survey of the anchorage on a scale of 10 inches to the nautic mile, also a small plan of Enciam islet and rocks, after completing which he was to proceed through the Paumben Pass into Palk Straits. Here he was to obtain additional soundings, and after noting the effect of the burst of the monsoon in the neighbourhood of Paumben Pass, leave for Cocanada. On arriving at Cocanada he was to commence a plan of that port, continuing to work in the southern portion of the Bay of Coringa until relieved by an Admiralty surveyor. On the 20th June I sent Lieutenant Hammond, R.N., to take command of the "Constance" and charge of the survey, relieving Mr. Chapman, who returned to Calcutta to prepare his fair sheets. Sub-lieutenant Petley, R.N., also was attached to the "Constance," and proceeded with Lieutenant Hammond to Cocanada by mail steamer. The "Constance."

33. The "Guide" was not ready until the 7th April. I was thus obliged to relinquish my first idea of sending her to survey the Megna Flat, or even False Point, as only one of the iron steam-cutters built in Kidderpore Yard was ready, and those built in England had not yet arrived. I therefore determined that with the view of testing her equipment, as well as for the purpose of ascertaining the qualifications of the officers who had been appointed in India to the subordinate grades in the survey, the "Guide" should proceed down the river in charge of Navigating Lieutenant Coghlan, R.N., and as a preliminary experiment, survey the dangerous James and Mary shoals, of which we possessed no scientific examination. The "Guide."

Surveys on, and
changes in, materiel.

34. The "Clyde" arrived in Calcutta on the 2nd April, and Staff Commander Ellis, R.N., reported that he had been obliged to sail the vessel during the whole of the voyage, as shortly after leaving Bombay the engines had broken down, and they were obliged to make the passage entirely under sail, never being able to start the engines. He also reported so unfavourably on the "Clyde's" sailing qualities, and on her suitability as a surveying vessel, that I applied to the Government to appoint a board of officers to hold a survey on her. In the meantime she was placed in the hands of the dockyard authorities, and the defect in the engines examined. On the 7th and 14th May 1875, respectively, a committee composed of the officers marginally noted held a survey on the vessel, but the report of the committee was never officially communicated to me.

Master Attendant.
Staff Commander
Ellis, R.N.
Nav. Lieutenant
Jarrad, R.N.

Survey on the
"Guide."

35. On the 24th May the "Guide" returned, having completed the work detailed in my instructions to Lieutenant Coghlan. During the progress of the survey, one of the iron steam-cutters built in Kidderpore Dockyard foundered, and could not be recovered. From Lieutenant Coghlan's report of this accident it appeared that these boats were unsuited for sea work, and only safe in the smoothest water. In accordance with my instructions, Lieutenant Coghlan forwarded a report on the capabilities and suitability of the "Guide" for surveying service, &c. This report contained numerous complaints against the material supplied, and an opinion that the vessel was in every way unsuited for the work. I therefore forwarded a copy of his report to the Government of India, asking that a committee might be appointed to survey the vessel, and inquire into the correctness of the statements made in the report. On this representation the Government appointed the officers marginally noted to hold a survey on the "Guide." The result of the inquiry was that, after completely opening out the vessel, she was found to be so affected by dry rot that the committee condemned her as unseaworthy, and they were of opinion that the vessel was so defective as to render it inadvisable to incur expenditure in repairs. It was certainly the duty of the dockyard officials, when they received the order to prepare and fit up the "Guide" for surveying service, to have first ascertained that she was in sound condition. It appears, however, that no steps were then taken to ascertain this important fact; but it subsequently transpired that a committee had, about two years previously, reported that the "Guide" would be fit for any service after undergoing a few necessary repairs.

Staff Commander
Ellis, R.N.
Nav. Lieutenant
Jarrad, R.N.
C. Ransom, Esq.,
Commanding I. G.
Steamer "Celerity."
J. Cranstoun, Esq.,
Builder, Dockyard.

36. By order of the Government of India the brig "Guide" and schooner "Lady Lawrence" (see para. 18) were re-transferred to the Marine Department on the 15th January 1876.

Changes in per-
sonnel.

37. Consequent on the above changes a reduction in the establishment of the executive officers became necessary. The services of Mr. D. B. King and Mr. W. Norman were dispensed with, and Mr. J. B. Morgan left, at his own request, on urgent private affairs.

38. Navigating Lieutenant Coghlan, deputy superintendent, 2nd grade, resigned his appointment on the 13th July 1875 and proceeded to England.

Operations for
1875-76.

39. On the 30th August 1875 the programme of operations for the season of 1875-76 was submitted to Government*, and it was asked that instructions might at once be given to the dockyard authorities to prepare the "Clyde" for service so as to enable her to start on the 1st November. It was not, however, until the 9th October 1875 that any intimation was given to this department that the defects of the "Clyde" would be made good. The next day was the first day of the Doorga Puja holidays; the dockyard was closed until the 18th October, and work not commenced until the following day.

Delay in commenc-
ing out-door work.

40. The above delay seriously affected the preparations, and it was not until the 13th November that the vessel was ready for sea, although every means had been taken in this department to expedite her departure. I feel it my duty to state that the continued delay in the issue of a Resolution ratifying the appoint-
ments

* The programme was subsequently modified, consequent on the "Guide" being condemned.

ments made in England by the Secretary of State, and defining the duties of the department, caused my movements, towards making the necessary arrangements for the proper conducting of the survey, to be so impeded as to render my position a most vexatious one. I may add that it was not until the issue of the Resolution on the 25th October that my proposals, even in the most trifling details, could be carried out effectively. Until that date none of the public offices recognised the existence of the department, and the inconvenience caused by this was especially felt in conducting the business with the Account and Marine Authorities. It was not, therefore, until 25th October 1875, more than 15 months after my appointment, that I was really able to carry on the duties of the department. The delay in the Marine Department passing orders on the "Clyde" is much to be regretted, as by this means nearly three weeks of the fine season were lost; whilst in the case of the "Constance" there was a loss of five weeks.

41. On the receipt of the Resolution, Captain Ellis took up the duties of Chief Naval Assistant, and the other officers were divided into two parties and attached to the "Clyde" and "Constance," the former under the command of Navigating Lieutenant F. W. Jarrad, R.N., and the latter under the command of Navigating Lieutenant G. C. Hammond, R.N. Parties formed.

42. On the 4th October 1875, in accordance with the orders of the Government, in the Department of Revenue, Agriculture, and Commerce, conveyed in their Letter, No. 251, dated 20th August 1875, I embarked on board the British India Steam Navigation Company's steamer "Mahratta," on a tour of inspection of the principal ports of Burma. I visited Chittagong, Akyab, Kyauk Phyou, Bassein, Rangoon, and Moulmein, returning to Calcutta on the 28th October. During my absence Staff Commander Ellis, R.N., deputy superintendent, remained in charge of the office. Visit of inspection to Burma ports.

43. From this visit of inspection I came to the conclusion that the charts of the coast of Burma were even less trustworthy than stated in my "Review of Admiralty Charts." But their deficiencies and errors are traceable mainly to this cause, viz., that, although within the last decade fresh surveys of some rivers and ports have been executed, no copies of these were sent to England owing mainly to the prevalent supposition among the marine officials that it was nobody's business to send them. Thus the charts used by the shipping, and even at the offices of the several masters-attendant, did not indicate the actual positions of the buoys which mark the approaches to three or four great ports. Errors in the charts, therefore, should not be attributed to defective Admiralty superintendence in England, but to apparent ignorance or apathy and neglect on the part of successive officials in the Indian Marine Department. Admiralty charts of Burma Coast.

44. The urgent necessity for providing a vessel of suitable construction, properly equipped and fitted for surveying, has become still more apparent since operations have been conducted in the "Clyde," the only vessel now at our disposal. The reports of Staff Commander Ellis, the committee ordered to survey her, and the officer conducting the survey on the Burma coast last year, all point to the unsatisfactory nature of the capabilities and accommodation of this vessel for the special and important duties for which she is required. All these disadvantages and the economy as well as efficiency to be derived from having a suitable vessel have been the subject of frequent correspondence during the past year. More suitable vessel much required.

45. The several ports of British India which are within convenient distance of head-quarters, and which afford special facilities for frequently replenishing coal and stores, will, after the coming season (1876-77), I trust, have all been re-surveyed, and I shall be unable to utilise the "Clyde" on more distant coasts except at a great disadvantage. I am therefore in hopes that the construction of the new steamer, sanction for which was granted by the Government of India last summer, will be pushed forward with all practicable dispatch, and that if possible, she may be ready for the season of 1877-78.

46. Mr. M. Chapman, assistant superintendent, 2nd grade, and Mr. P. J. Falle, assistant superintendent, 3rd grade, were specially brought to my notice by Lieutenant Jarrad, as officers deserving of advancement, and as there Good services of the officers.

were vacancies in the department, I recommended their promotion to higher grades.

47. I cannot close this section of my report without putting on record the most valuable assistance rendered to me by the officers of my department in organising an office based on the long-trying and well-working system which has made the British Hydrographic Office so famous throughout the world.

48. On the 31st March 1876 the strength of the Marine Survey Department was as follows :—

SUPERINTENDENT'S OFFICE.

Superintendent of Marine Surveys	-	-	Commander A. Dundas Taylor, I.N., F.R.G.S.
Deputy Superintendent, 1st Grade	-	-	Staff Commander J. H. Ellis, R.N.
Head Clerk and Accountant	-	-	Mr. Donald Sunder.
Clerk	-	-	Preonath Mookerjee.
Copyists	-	-	{ Essen Chunder Das.
			{ Bidhoo Bhushan Dey.

DRAWING BRANCH.

Superintendent	-	-	-	Robert C. Carrington, Esq.
Chief Draftsman	-	-	-	Kally Das Seal.
Draftsman	-	-	-	Abdool Kurreem.
"	-	-	-	Thomas Rebeiro.
"	-	-	-	Abdoor Ruheem.
Chart Clerk	-	-	-	Jodoo Nath Das.

One chart moulder, one duftry, one duffadar, four peons, and two menials.

EXECUTIVE STAFF OF SCIENTIFIC OFFICERS.

Navigating Lieutenant F. W. Jarrad, R.N.	-	-	-	Deputy Superintendent, 2nd Grade, Commanding I. G. S. "Clyde."
Navigating Lieutenant G. C. Hammond, R.N.	-	-	-	Assistant Superintendent, 1st Grade, Commanding I. G. S. "Constance."
(Vacant)	-	-	-	Assistant Superintendent, 1st Grade.
Navigating Sub-Lieutenant E. W. Petley, R.N.	-	-	-	Assistant Superintendent, 2nd Grade, attached to I. G. S. "Constance."
Mr. Morris Chapman, I.N.	-	-	-	Assistant Superintendent, 2nd Grade, attached to I. G. S. "Clyde."
(Vacant)	-	-	-	Assistant Superintendent, 2nd Grade.
(Vacant)	-	-	-	- ditto.
Mr. P. J. Falle	-	-	-	Ditto, 3rd Grade, attached to I. G. S. "Clyde."
(Vacant)	-	-	-	Assistant Superintendent, 3rd Grade.

SURGEON AND NATURALIST.

Dr. J. Armstrong, B.A.	-	-	-	Attached to I. G. S. "Clyde."
------------------------	---	---	---	-------------------------------

EXECUTIVE OFFICERS.

Mr. G. W. Hill	-	-	-	Attached to I. G. S. "Clyde."
Mr. T. H. Baker	-	-	-	Attached to I. G. S. "Constance."

A. Dundas Taylor,
Commander (late I.N.),
Superintendent of Marine Surveys.

SECTION II.

DRAWING BRANCH.

STATEMENT showing the Nature of the WORK performed in the DRAWING BRANCH from May 1875 to 31st March 1876.

THIS branch, under the superintendence of Mr. R. C. Carrington, has been busily engaged in the production of New Navigating Sheets of the Coast of India, comprising the whole series from Karachi to Pulo Penang. Five D. E. (*double elephant*) sheets have been compiled and forwarded to the Secretary of State, and they are now in course of being engraved. Several new Charts of Ports and Anchorages, much needed, have also been prepared and photozincographed, as detailed in the following Tables:—

Number of Chart.	TITLE.	Size.	Scale.	REMARKS.
15a	Sheet 1: Karachi to Pigeon Island, in lat. 14° S.	D. E.	3·2 inches = 1 degree.	Compiled from the surveys of Commanders Ethersey, Grieve, Taylor, &c. The Kattywar Coast has been reduced from the original chart discovered by Captain Taylor, at Bombay, and shows details never before published; the whole coast has been adapted to the latest astronomical positions in connection with the Great Trigonometrical Survey, and other information regarding lights, &c., corrected to date of publication.
	Sheet 2: Vingorla to Cocanada - - -	2 D. E.	3·2 inches = 1 degree.	The portion of the coast between Vingorla on the west, to Cocanada on the east, is embraced in this chart, to be published on two double elephant sheets. It is intended that these two sheets should be joined to form one good navigating chart of the southern portion of India and the Island of Ceylon. The coast has been most carefully reduced from the large scale Admiralty Charts, and the interior, showing the principal mountain ranges and river courses, as well as all the railways branching from Madras, has been taken from the latest impressions of the "Atlas of India" sheets. The interior of the Island of Ceylon has been reduced from the excellent large scale map by Arrowsmith, and other notes added from Sir James Emerson Tennent's "Ceylon." All the latest hydrographic information has been inserted, the whole being adapted to the latest astronomical determinations.
15b	Sheet 3: Cocanada to Bassein River - - -	D. E.	32 inches = 1 degree.	Embraces the northern portion of the Bay of Bengal from Cocanada to Bassein River, and includes the whole of the delta of the Ganges. The principal hill ranges, and other details of Aracan and Pegu, have been taken from the Revenue Survey maps of those provinces, and adapted to the latest observations determined by the Hydrographic Surveys of the Indian and Royal Navies.
15c	Sheet 4: Bassein River to Pulo Penang - - -	D. E.	3·2 inches = 1 degree.	Embraces the coast between Bassein River and Pulo Penang, and includes the Andaman and Nicobar Islands. In the compilation of this sheet it was discovered that the difference of longitude, as shown on the Admiralty Charts between Rangoon and Amherst, could not be correct, as the whole of the coast of Tenasserim, &c., between Moulmain and Penang was, by accepting this, thrown upwards of four miles too far west. As this was a most important matter to be settled, a meridian distance was measured between Rangoon and Amherst (the entrance to Moulmain River). The positions of the town of Rangoon and Elephant Point Pagoda were determined in connection with the Great Trigonometrical Survey, and forwarded to this department by Colonel Walker. The result of the meridian distance, applied to these positions, showed that the longitude of Amherst has hitherto been incorrectly shown on the Admiralty Charts. The new position agreed exactly with the work brought up from Penang in connection with Singapore. The delta of the Irrawaddy, as also the interior of Tenasserim and Tavoy, as far south as the Pakchan River, has been reduced from the Revenue Survey maps; the Nicobar and Andaman Islands from the latest corrected Admiralty Charts.

[NOTE.—The above series of sheets are being engraved in England.]

SECTION II.—DRAWING BRANCH—*continued.*

Number of Chart.	TITLE.	Size.	Scale.	REMARKS.
47 4z. d.	Kattiawar Coast, by Lieutenant A. M. Grieve, I. N., brig "Palinurus," 1854.	2 D. E.	M=0.5	100 copies photozincographed.
117	Luff Point to Anchoring Creek, showing the James and Mary Shoals, and the entrance to the Roopnarain, River Hooghly, from the Survey by Navigating Lieutenant J. E. Coghlan, R.N.	Atlas	M=6 0	300 copies photozincographed. The sheet was much needed by local pilots and engineers, and can be always used as a reference sheet, being sectionally sounded.
61	Cherbaniani Reef, Chitlac and Kiltan Islands, Lakadivh Archipelago, from the surveys by Lieutenants Selby and Taylor, late I.N., brig "Taptee," 1848.	Small Atlas.	M=2.0	150 copies photozincographed. Reproduced as a record of the survey.
81	Kolachel Roadstead and Enciam Rocks, Travankor, from the survey by M. Chapman, late I.N., I.G. schooner "Constance," 1875.	Atlas	M=10.0	300 copies photozincographed. Hitherto no plan has existed of this coffee port; was also much needed by the Commanders of the B. I. S. N. Company's steamers.
53	Byramgore Reef and Chereapani Lakadivh Archipelago, and Angria Bank, from the surveys by Lieutenant Selby and Taylor, late I.N., 1847-48.	Atlas	M=2.0 M=2.5	150 copies photozincographed. Reproduced as a record of the survey.
113	Coringa or Cocanada Bay and the mouths of the Godavery, Bay of Bengal, from the survey by Navigating Lieutenant G. C. Hammond, R.N.	D. E.	M=2.0	500 copies photozincographed. This is a most important sheet, as the old chart was misleading in the extreme.
851	Quilon Roads, west coast of India, from a sketch by Lieutenant A. D. Taylor, late I. N., 1858.	D. E. 4	M=2.0	200 copies photozincographed. Published at the request of the Commanders of the B. I. S. N. Company's steamers.
109	False Point anchorage, coast of Orissa, from the survey by H. A. Harris, Conservator of Orissa Ports.	D. E. 4	M=1.5	100 copies photozincographed. Published at the request of the Commissioner of Orissa, as a temporary chart until the new survey by Lieutenant Hammond, R.N., can be produced.
39	Entrance to Rajpuri River, west coast of India, compilation from a sketch by Navigating Lieutenant W. P. Haynes, R.N., and surveys by officers of the late Indian Navy, 1876.	D. E.	M=4.0	200 copies photozincographed. Published, as there was no existing plan of the anchorage.
	Index Chart of lighthouses and light-vessels in British India.	D. E. 4		150 copies photozincographed. Bound up with the new Light List.
	Magnetic chart of the Indian Ocean	-	-	In course of preparation.

SECTION II.—DRAWING BRANCH—*continued.*

MISCELLANEOUS.	FOR WHAT PURPOSE EXECUTED.
Reduction of False Point Anchorage for comparison with Admiralty Chart.	For office use.
Tracing of Arrowsmith's map of Ceylon - - - -	ditto.
Copy of Kopah Inlet, Siam Coast - - - -	For the hydrographer to the Admiralty.
Tracing of Mr. Harris's Survey of False Point -	For Lieutenant Hammond, R.N.
Inserting fathom lines and coast line on 50 sheets of Bahrein Harbour.	For issue and sale.
Reduction of Heathcote's Survey of entrance to the River Hooghly for comparison with Admiralty Chart.	For office use.
Compilation of the River Hooghly and its approaches.	For the use of the Committee inquiring into the River Survey Department.
Copy of Rangoon approaches, by Lieutenant Jarrad, R.N., 1876 - - - -	For transmission to the Hydrographer to the Admiralty.
Numerous tracings, corrections, and additions to several charts.	For the Hydrographer and other Naval authorities.

CHARTS CORRECTED.

During the year 1,091 charts have been examined and corrected for new lights, buoys, shoals, beacons, &c., and the following hydrographic notices to mariners attended to, and the charts corrected accordingly:

244 English - - -	Notices to mariners, affecting 198 charts.
364 American " " "	37 "
17 Indian Government " "	116 "
188 Spanish " "	47 "
511 Dutch " "	59 "
167 German " "	72 "

NEW PUBLICATIONS.

A list of lighthouses and light-vessels in British India, with an Index Chart showing the position of the various lights.

A Catalogue of Charts for 1876.

Spheroidal Tables, showing the length in feet of a degree, minute, and second of latitude and longitude; the corresponding number of statute miles in each degree of latitude; the number of minutes of latitude or nautic miles, contained in a degree of longitude, under each parallel of latitude; and the length, in cables, of a minute of longitude, corresponding to each nautic mile; for every 10 minutes of the quadrant, compression $\frac{2}{3}$, by R. C. Carrington.

SECTION III.

SURVEYING OPERATIONS.

(Early part of 1875.)

TRÁVANCORE AND GULF OF MANAR.

(I. G. Schooner "Constance.")

Personnel.
 Mr. M. Chapman, late I. N.,
 Officiating Assistant Super-
 intendent, 1st grade,
 Mr. Hill, Executive Officer.
 " Baker,
 " Searle, Surveying Amanuensis.

THE "Constance," with staff as per margin, left Bombay on the 29th January 1875, and arrived at Kolachel on the 7th February. The staff was only a temporary one, as there were no other naval surveyors available, and Mr. Chapman, who was the only surveyor on board, was consequently working really alone; he, however, reports that the executive officers showed a desire to acquire a knowledge of surveying, and were of some assistance to him in this survey.

Survey of Kolachel
 and Enciam rocks.

Work was commenced on the 8th February. The survey was executed more in the style of a land survey, as Mr. Chapman's knowledge was gained under Mr. Girdlestone (late I. N.) of the Topographical Survey of India, who, for a time was lent to command the "Constance" for the purpose of surveying Bahrein in the Persian Gulf. The coast was charted by means of a traverse survey with theodolite, chain and plane table, and the soundings were not obtained in sections, but Mr. Chapman made a plan of the port which, to all intents and purposes, suffices for the requirements of navigation. The amount of coast charted was 6 miles, and $5\frac{1}{2}$ square miles of water were examined.

Soundings in Palk
 Strait and Gulf
 of Manar.

The "Constance" left Kolachel, and, touching at Tuticorin for water, proceeded through the Paumben Pass to Paumben. During the month of April Mr. Chapman was working in Palk Strait, obtaining additional soundings and verifying those on the published charts. After noting the burst of the south-west monsoon from Condigal Point, the "Constance" left on the 16th May, and, after touching at Madras, arrived at Cocanada on the 23rd May.

Cocanada Survey.

The survey of Cocanada was at once commenced by Mr. Chapman, and he carried on the work in the southern portion of the bay until relieved by Lieutenant Hammond, R.N., on the 21st June, when he returned to Calcutta. From that date the survey was carried on by Lieutenant Hammond assisted by Sub-Lieutenant Petley, and was completed on the 24th August. The survey comprised 79 square miles of water and 42 miles of coast charted on a scale of 2 inches = 1 nautic mile. Lieutenant Hammond furnished a lengthy report on the question of effectively lighting the port of Cocanada, which was forwarded to the Government for consideration. On the 12th September the "Constance" arrived in Calcutta.

RIVER HOOGHLY.

(I. G. Brig "Guide.")

Personnel.
 Navigating Lieutenant J. E.
 Coghlan, R.N., Deputy Su-
 perintendent, } Commanding.
 Navigating Lieutenant G. C. Hammond, R.N.,
 Assistant Superintendent, 1st grade.
 Sub-Lieutenant C. George, R.N., Assistant
 Superintendent, 2nd grade.
 Sub-Lieutenant E. W. Petley, R.N., Assis-
 tant Superintendent, 2nd grade.
 Mr. J. Nickels, Assistant Superintendent,
 2nd grade.
 Mr. P. J. Falle, Assistant Superintendent,
 3rd grade.
 Mr. C. J. Wortley, Assistant Superintendent,
 3rd grade.

On the 8th April, the "Guide," with staff named in the margin, proceeded down the river and anchored off Roychuck, in the vicinity of the James and Mary Shoals. The plan of this dangerous part of the Hughli, Luff Point to Anchoring Creek, including the entrance to the Roopnarain River, was constructed on 10 inches to the nautic mile, the river within these limits being sounded in sections which in no case were more than 400 feet apart. The work was completed on the 24th May, when the "Guide" returned to Calcutta, and Sub-Lieutenant George commenced preparing the fair sheet, which was afterwards reduced and photo-zincographed on a scale of 6 inches to the nautic mile. It is a valuable chart for record, and, if the whole of the river from Chandernagore to the sea were similarly surveyed from year to year, the comparison of these minute surveys, and the knowledge of the action of the tides and

and freshets on particular localities, which such a rigorous survey would impart, would enable engineering works for the improvement of the conservancy of the river to be carried out with confidence as to their results.

SOUTHERN INDIA AND LACCADIVE ISLANDS.

(I. G. S. "Clyde," 300 Tons, 60 h. p.)

Staff-Commander Ellis, R.N., with officers named in the margin, proceeded on the 2nd February in the "Clyde" for Calcutta, the headquarters of the Marine Survey Department, taking as passenger Mr. A. O. Hume, C.B., Secretary to the Government of India, Department of Revenue, Agriculture, and Commerce, as important questions concerning lighthouses, commerce, and navigation had to be considered by him.

Personnel.
Mr. J. B. Morgan, } Executive Officers.
" D. B. King, }
Dr. J. Armstrong, Surgeon and Naturalist.

The "Clyde" finally left Bombay for Pigeon Island, calling *en route* at Vin-gorla Rocks and St. George's Islands. During this short trip the engines broke down entirely, in consequence of several portions of the machinery becoming disabled, and further by the jamming of the screw-shaft in the sternpost aperture. Thence to Calcutta the voyage was performed under sail alone.

Having secured the necessary chronometrical and astronomical observations at Pigeon Island for connecting by meridian distance* this island with one of the Laccadive group, sail was made on the 8th February for Cherbaniani, and whilst proceeding thither several deep soundings were obtained.

Laccadive Islands.

Cherbaniani, the northernmost dangerous reef of the group, was reached on the 11th, and anchorage obtained in 8 fathoms, about 200 yards from its south-west edge. From the observations and exploration made, no change in the shape or extent of the reef had occurred since the survey by Lieutenants Selby and Taylor in 1848. The *sandbanks* mentioned in the west coast of Hindoostan Pilot, as situated on its north and east side, proved to be heaps of decayed coral.

Betra-par, to the southward, was the next reef visited, and astronomical observations obtained on Tree Island, situated at its northern extremity. Mr. Morgan, who explored this reef, informed Commander Ellis that the sandy islet stated in the "Sailing Directory" to lie to the eastward of the reef did not exist.

The vessel then visited, in the order mentioned, other islands of the group, viz., Kiltan, Cardamum, where observations for meridian distance and circum-meridian altitudes for latitude were taken, Ameni, Pere-mul-par, Aucutta group, Pitie sandbank, and Cabruti. These islands and reefs, excepting Kiltan, which is well surveyed, are very insufficiently examined, and great caution is necessary when navigating in their vicinity. From the "Clyde" breakers and several shoal-patches were observed, when sailing between Aucutta and the islands Bingaro and Tingaro, to the north-east.

Proceeding to Kolachel, where the vessel arrived 27th February, a deep sounding of 990 fathoms was obtained, 19 miles due west of Kalpeni, and 1,290 fathoms, in latitude $9^{\circ} 38' 40''$ N., longitude $74^{\circ} 55' 40''$ E., the nature of the bottom in neither case being ascertained, owing to the line parting when hauling in. This sounding-line, previous to its being supplied to the "Clyde," had been in store at Bombay Dockyard for upwards of 14 years, and on examination was found to be in a state of great decay.

Leaving Kolachel on 28th February, having taken on board stores, &c., the vessel anchored at Tuticorin outer anchorage (distant about 90 miles from Kolachel) on 8th March, having experienced head-winds or a succession of fresh north-east breezes for the first week. This trip afforded Commander Ellis an excellent opportunity for testing the sailing qualities of the "Clyde," which resulted on arrival at Calcutta in a very unfavourable report. The voyage thus far having been tediously long, Mr. Hume, whose term of leave had nearly expired, decided to land and overtake a steamer at Madras, to enable

him

* Since forwarded to the Hydrographer of the Admiralty.

him to resume his public duties at Calcutta on the expiration of his leave, as it was found by continuing on the "Clyde" it would be quite impossible to do so. During a stay of five days the chronometers were rated by observations on Hare Island, thus connecting this island with Cardamum of the Laccadives.

On the 15th March the vessel anchored at Paumben Horseshoe Bank Channel, and in accordance with instructions, an examination was made of the depth of the channel into Mootapetta Bay (Port Lorne), and the soundings near that locality were tested, which, on comparison with Captain Powell's survey of 1837, differed considerably. The soundings in the Eastern Channel, between the Shingle Islets, Cooreesuddy Island, and Ramesaram Island, were likewise tested, and, although agreeing tolerably well with the former survey, it is desirable that a new survey, when opportunity offers, should be made. The positions of the several conspicuous white beacons which have been erected of late years to facilitate the navigation of Paumben Pass, buoys, and other marks, were obtained. The dredging and blasting operations are still continued in the Pass, and a depth (March 1875) of 11 feet 9 inches attained, it being confidently expected that the Pass would soon be available for vessels of 14 feet draught.

The "Clyde" was then taken to a position about $2\frac{1}{2}$ miles off shore to the northward of Ramnad Promontory, in latitude $9^{\circ} 20' N.$, longitude $79^{\circ} 6' E.$, and the distances from high-water line of the 2, 3, 4 and 5-fathom low-water depths were ascertained. It was near this position that the site of a proposed cutting, or ship-canal, through Tonitory Point, by Sir James Elphinstone, received recently some attention by Mr. George Robertson, a civil engineer appointed by the Government of India to report on Indian harbours. He had only time, however, for a very cursory examination; but this, together with several other proposed schemes, has been rejected for the less costly undertaking of deepening, by dredging and blasting operations, the channel formed by nature.

Commander Ellis now decided to push on as fast as possible for Calcutta, as it was impossible, for the want of steam, the limited means at his disposal, and being single-handed, to carry out further the several investigations in Palk's Bay which I had instructed him to make. He accordingly left Paumben on the 20th March, calling at Madras on the 24th for provisions, &c., and arrived in Calcutta on 2nd April.

During the voyage the dredge was used whenever practicable, and many marine specimens of interest were collected. Some good specimens of sea-birds were also collected and preserved, which were of use to Mr. Hume in writing his valuable papers on Indian Ornithology.

SURVEYING OPERATIONS.

(Season, 1875-76.)

BURMA COAST.

I. G. Steamer "Clyde."

THE "Clyde," with staff marginally noted, left Calcutta *en route* for Rangoon on the 13th November 1875. When off Cape Negrais the dredge was used as often as practicable, but the locality proved to be too rocky to afford many natural history specimens; and the "Clyde" anchored at Diamond Island on the 20th November, to rate the chronometers, and allow Dr. Armstrong to explore the reefs, which extend one and a half miles from the south point of Diamond Island. Leaving Diamond Island on the 22nd, the "Clyde" arrived at Rangoon on the 24th. Coaling and making the necessary arrangements for the transit of a party for the purpose of

Personnel.

Navigating Lieutenant F. W. Jarrad, R.N., Deputy Superintendent.	} Commanding.
Navigating Sub-Lieutenant C. George, R.N., Assistant Superintendent, 1st grade.	
Mr. M. Chapman, I.N., Assistant Superintendent, 2nd grade.	
Mr. P. J. Falle, Assistant Superintendent, 3rd grade.	
Dr. J. Armstrong, B.A., Surgeon and Naturalist.	

of erecting stations along the hitherto unmapped shore between Elephant Point and the entrance to the To-Kwa (China Ba-keer) River occupied until the morning of the 28th November, when the vessel proceeded down the river and anchored off Elephant Point. Work was commenced on the 29th November.

Lieutenant Jarrad reported that the erection of a tide-pole in a suitable position was a matter of great difficulty, owing to the exposed nature of the only available positions, and great strength of the tidal stream, which, acting on the great length of pole necessary to register 22 feet rise and fall, caused it frequently to be swept away. Indeed, the tide-pole appears to have been a continued source of anxiety from the frequency in which it was broken off by the above causes, or from native boats fouling it, and thus many days' work was utterly lost. It is most important that a substantial tide-pole should be erected at Elephant Point, so that there would be no delay or difficulty in examining the river at any time. A series of uninterrupted tidal observations at this place would be of great value, and I hope ere long to see a self-registering tide-gauge erected there. The erection of the main stations occupied some time, especially those along the coast between Elephant Point and the China Ba-keer River, where, owing to the great distance the mud banks extended off-shore, considerable difficulty was experienced in landing. A party, however, after several ineffectual attempts, at last succeeded in landing the necessary tents and instruments, and, through the kind assistance of Lieutenant Parrot, Assistant Commissioner, who made all the arrangements for the transit of the party, &c., the work was successfully accomplished in four days. Owing to the coast being so low, and in most parts fringed with mangroves to the water's edge, the main stations required to be of some dimensions, and also to be constructed in a very substantial manner. Ordinary marks could be but barely discerned at the edge of the mud flats, much less could they be distinguished in the channels where they were required to be seen in order to fix the soundings. Occasional bad weather and high tides rendered it necessary to renew these marks once or twice during the progress of the survey. Unfortunately, the nature of the ground (soft mud) prevented any steps being taken towards arranging for permanent stone or brick pillars being placed to mark the sites of the several main stations of the survey. Owing to the strength of the tidal stream during spring-tides, the boats were able to do but little sounding at that period, and the operations were then confined to shore work; indeed, it might almost be said that the sounding was solely performed during neap-tides. During the months of November and December the strong breezes caused a heavy sea on the banks and very much impeded the progress of the work, while the continuous thick fogs in January and February were the cause of sometimes three or four days at a time being lost. The survey was thus not completed until the 8th March, a month later than was estimated.

The survey of the approaches to Rangoon river comprised $37\frac{1}{2}$ miles of coast trigonometrically laid down, and 216 square miles of water examined; the new chart extending 30 miles north and south, and 18 miles east and west. The difficulty of sounding sectionally with the exactitude with which this survey was executed in such strong tides and on a low coast, where marks cannot be made prominent, cannot be overestimated.

In compiling in the Drawing Branch Sheet 4 of the coast series,* Mr. Carrington found that when the coast of Tenasserim was drawn in connection with Singapore and Penang, there existed a gap of about $4\frac{1}{2}$ miles of longitude between the above coast and that inserted from the Admiralty Chart of the Gulf of Martaban, &c.

To clear up this very important point, I telegraphed to Lieutenant Jarrad at Rangoon, and ordered him to make the necessary observations for measuring a meridian distance between Elephant Point (Obelisk), Rangoon River—the position of which had recently been determined by Mr. Beverley, of the Great Trigonometrical Survey of India—and Amherst Point (Pagoda), Moulmein River. The meridian distance was measured with eight chronometers, the errors of which were determined on each occasion by six sets of observations of equal altitudes

Survey of Rangoon.

Extent of survey of Rangoon approaches.

Longitude of Amherst.

* See page 13.

altitudes of the sun's limbs and centre, observed at Elephant Point on the 22nd February and 2nd March, and at Amherst on the 24th and 29th February. The travelling rates deduced from the above observations, when applied, gave the results shown in Appendix H.

The range of the difference in the results of the meridian distances, as shown by each of the eight chronometers, was 2.25 seconds.

The result was most satisfactory, as it proved the correctness of Captain Ross' triangulation of the coast of Tenasserim in connection with the astronomical positions of Singapore and Penang, and cleared up the discrepancy existing between the position of Amherst, as shown on Sheet 4, in connection with Singapore, and the position of the same place as shown on the Admiralty Chart of the Gulf of Martaban, No. 823, by proving that the position, as given on the above-named document, was $4\frac{1}{2}$ miles in error :

Longitude of Elephant Point Obelisk, as determined by Great Trigonometrical Survey - - - - -	96 19 14.2
Meridian distance by Lieutenant Jarrad, R.N. - - - - -	1 13 49.10
Longitude of Amherst Point Pagoda - - - - -	97 33 03.3
Longitude from Admiralty Chart, No. 823 - - - - -	97 28 30.0
Error in position of Amherst on Admiralty Chart - - - - -	4 33.3

Rangoon and Amherst had not previously been connected by a meridian distance, and I consider this to have settled a very important point.

Want of a series of meridian distances.

I have determined on having observations made next season at Diamond Island (off Cape Negrais) and Amherst, for the same purpose. We should then have three of the principal points in the Gulf of Martaban in their relative astronomical positions. An entire series of meridian distances was one of the principal wants referred to by the committee of which Captain Constable was a member, and who reported on the want of Indian marine surveys as far back as 1862. The whole of the eastern side of the Bay of Bengal has hitherto been very incorrectly laid down on the Admiralty Charts; an error of from five to eight miles sometimes existing, and no systematic astronomical connection of the principal places along the seaboard has ever been made. As our surveys progress, these errors will be cleared up, as, when a suitable vessel is provided, a chain of rigorously measured meridian distances will form the primary work on each coast; but although we must wait for such a systematic method of procedure, from want of suitable means, we can clear up gradually a few of the existing errors in longitude; and this is being done.

Reported error in the position of the Krishna Light.

The Krishna Shoal Light had been reported out of position by the officer commanding I. G. steamer "Nemesis." I therefore instructed Lieutenant Jarrad to test, if time and circumstances permitted him, the correctness or otherwise of this statement, on his way from Rangoon to Akyab. This was done, and the result shows that the Krishna Lighthouse is in the position assigned to it on Admiralty Chart No. 823, and that the report of the above officer was incorrect.

Reported extension of the Baragua Flat.

Lieutenant Jarrad also obtained a line of soundings westward of the Krishna Light, which, although not sufficient to be called an examination, yet goes to prove that the Baragua Flat has not extended to the southward, as reported to the Government by the officer commanding the I. G. steamer "Tenasserim." Stringent orders should be issued to the commanders of these vessels to take every opportunity of verifying any suspected discrepancy or error in the charts or sailing directions, of which they have frequent opportunities; and they should also be instructed that, in the event of their discovering any such error, their report should contain a clear and concise statement of the steps which were taken to establish a proof of the correctness of their conjectures; the observations taken should also accompany the statement. Statements of the nature above alluded to, unsupported by any direct proof, are worse than useless; they are mischievous.

It was the intention to have tested the longitude of Diamond Island, but on the

the "Clyde's" arrival there the weather was so unfavourable that the vessel was obliged to anchor under the lee of the island for shelter. Here she remained for two days, during which time the sea was so heavy as to render landing on the island impracticable.

On the 16th March the weather moderated, and the "Clyde" left for Akyab, sounding at intervals to ascertain if the depth admitted of putting over the dredge. The dredging operations were of necessity limited to shallow water, owing to the lack of the necessary appliances for deep-sea sounding and dredging on board.* The greater number of dredgings were obtained in depths varying from 90 to 10 fathoms to the southward and westward of Cheduba Island, and thence northward towards Akyab, passing the Terrible Rocks at about seven miles off. This locality proved to be very prolific, and afforded several very beautiful specimens, some of which I believe are entirely new.

Dredging between Diamond Island and Akyab.

The "Clyde" arrived at Akyab on the 20th March, and on the 21st the survey was commenced, and by the end of the month the base had been measured and the main triangulation obtained. Much of the surveyor's time was spent in superintending parties clearing the tops of the hills of jungle to enable the necessary stations to be erected. On the summit of Borongo the jungle was so high as to necessitate a party staying there two days. Lieutenant Jarrad reports it difficult to obtain Burmese to cut the jungle, as the natives are extremely independent, and demand very high wages. The want of an interpreter, too, was much felt here, as none of the natives understood a word of English or Hindustani, and communication with them was carried on with difficulty.

Survey of Akyab.

Cholera had been spreading for some time amongst the native population, especially amongst the coolies employed in the rice-mills, numbers of whom died daily; and there had also been some fatal cases among the shipping and in the prison. On the night of the 30th March Navigating Sub-Lieutenant C. George, R.N., assistant superintendent (1st grade), was suddenly seized with this fatal disease, and although everything was done by Dr. Armstrong (the surgeon of the "Clyde"), and the civil surgeon of Akyab (Dr. Mountjoy), to arrest the progress of the disease, this unfortunate officer died at noon on the 1st April. As some of the officers and crew were suffering from symptoms of a similar character, Lieutenant Jarrad decided, with the concurrence of Dr. Armstrong, that the ship should be vacated by the healthy portion of the crew. This was accordingly done, and a camp was formed on the sea-beach in a healthy situation, while both healthy and sick were narrowly watched. The ship was fumigated and thoroughly cleaned in a few days, and fortunately no more cases occurred, and the worst case amongst the sick recovered.

Death of Sub-lieutenant C. George, R.N.

As I was then on my way down the coast of Burmah on a visit of inspection, I saw Lieutenant Jarrad at Akyab, and as cholera was still raging in the district, I ordered Lieutenant Jarrad to suspend his operations, and, with a view of recruiting the health of the officers and crew, leave Akyab for a cruise outside, during which time he was to visit the Terrible Rocks and ascertain on which group a light-house could best be erected in the event of its being found necessary to establish a light there, and he was also to obtain soundings and dredgings as opportunity offered.

The "Clyde" left Akyab on the 10th April, sounding and dredging to the southward towards Cheduba Island, where the vessel anchored. The channel between Cheduba and the mainland of Ramree Island was examined and found to contain very uneven depths, the general features not at all agreeing with the published chart; but the weather was so threatening, and heavy rollers had set in from the south-west, that only a very rough examination could be made, and the anchorage was so exposed that, taking into consideration that bad weather might be expected at any moment, Lieutenant Jarrad thought it unsafe to remain there. The "Clyde" therefore proceeded northwards, and tested the correctness of the coast of Ramree Island between Cheduba and Kyouk Phyou, as delineated on Admiralty Chart No. 821. Lieutenant Jarrad reports it to be very roughly laid down, the character of the coast (high hill ranges) not shown, and the whole to be "out of bearing"† when referred to Cheduba Island.

The coast between Cheduba and Kyouk Phyou.

This

* The "Clyde" is too small for a sea surveying vessel, and could not be fitted with the necessary gear without great expense, and no adequate return could be expected.

† See page 33, Appendix F.

This is to be easily accounted for, as the chart referred to was compiled in the Hydrographic Office from the best material in hand; but as these were more of the nature of sketches than surveys, and as the astronomical positions of the points between which the coast was filled in were never ascertained by any rigorous method, it is more than probable that considerable errors exist in the longitudinal distance between many places (as was the case between Elephant Point and Amherst), and consequently portions of the coast, though charted locally with tolerable correctness, may be relatively very much out of bearing.

Terrible Rocks.

Westerly rollers, causing the sea to break heavily, prevented a landing being effected on any of the rocks of the group, and after spending a day in their vicinity, the threatening appearance of the weather made it advisable to seek a safe anchorage in Kyouk Phyou.

Examination of Kyouk Phyou.

The examination of Kyouk Phyou harbour was at once commenced. The necessary stations were erected, and the main triangulation obtained, the buoys fixed, the Bombay and Reliance Shoals examined, and part of the coast and foreshore plotted on a dry proof of the published Admiralty plan of the harbour. This was done for the purpose of ascertaining whether the published plan was sufficiently correct with respect to the shore details, so as to necessitate only a re-examination of the reefs and anchorage. The published plan, however, was found so incorrect that I have arranged for the survey of this harbour to be continued next season, should time admit of this being done.

The fine weather broke up on the coast of Burma about the 15th April, and the "Clyde" left Kyouk Phyou on the 24th, arriving at Calcutta on the 28th, having experienced heavy weather off the Sandheads.

Considering all the difficulties with which Lieutenant Jarrad has had to contend in this the first season of the resumption of Marine Surveys in India, that he was working with a native crew, and that a great part of his time was necessarily devoted to bringing the members of his staff, who had been gathered from different sources, to work in a uniform and systematic manner, and also that the vessel affords none of the facilities for scientific surveying which are to be met with in a vessel engaged on similar service in the Royal Navy, I think the outturn of work has been satisfactory.

ORISSA COAST.

(I. G. schooner "Constance.")

The "Constance," with the staff detailed in the margin, left Calcutta on 6th December 1875, arriving at False Point on the 9th December,

Personnel.
 Navigating Lieutenant G. C. Hammond, R.N.,
 Assistant Superintendent, 1st grade, Com-
 manding.
 Navigating Sub-Lieutenant E. W. Petley, R.N.,
 Assistant Superintendent, 2nd grade.
 Mr. W. H. W. Searle, Surveying Amanu-
 ensis.

but bad weather prevented Lieutenant Hammond commencing work until the 12th. The base having been measured, the necessary stations erected, and the main triangulation having been obtained, a large scale plan of the anchorage was begun on a scale of 6 inches to a nautic mile. On the 28th, however,

the steam-cutter broke down, and it was found necessary to haul the boat on the beach for repair; and from this date until the 10th January the work had to be done in pulling-boats. On the 8th February the steam-cutter's connecting rod broke, and the boat was again laid up for six weeks, until a new rod could be sent from Calcutta. Owing to these mishaps, and the extreme labour required in sounding in pulling-boats, the work progressed slowly, and it was not until the 9th March that the survey in this locality, detailed in Lieutenant Hammond's instructions, was completed. Besides the 6-inch plan of the anchorage, the coast as far as 5 miles south of False Point Lighthouse and 10 miles to the north was surveyed on a scale of 3 inches to the nautic mile, the soundings extending to from 5 to 8 miles off shore.

Survey of False Point.

The survey comprised 62 miles of coast trigonometrically laid down, and 120 square miles of water examined.

Survey of Palmyras shoals.

Lieutenant Hammond, finding that the southerly winds were then so strong as to prevent a survey of the south-eastern part of Palmyras shoal, left for the northern portion of the shoal off the Dhumrah river, where he arrived on the 17th March. A base of 5935.4 feet having been measured on Shortt's tripod sand

sand (the only available dry patch), he commenced the triangulation, putting down buoys seaward and towards Palmyras reef buoy preparatory to sounding the shoals. This occupied a considerable time, as such a heavy sea was running it was found impossible to utilize the steam-cutter, and pulling-boats had to be employed; however, 11 lines of soundings, covering about 4 square miles of water, were taken, but unfortunately on the 27th of March, as Lieutenant Hammond informed me in the monthly report of proceedings, a heavy gale had swept away all his sounding buoys, blown down the stations and tide-pole, and completely stopped his working, and that as he was quite unable to do anything, he had proceeded inside the Dhumrah river to await orders. He also stated that the greater part of the time was occupied in procuring water, the nearest obtainable being at Chandbally, about 35 miles from the working ground; that a great number of his crew were sick, and in a semi-official letter to Captain Ellis, who was in charge of the office during my absence, stated his inability through ill-health to proceed with the work. He was therefore recalled, and arrived at Calcutta on the 19th April.

Considering the many drawbacks Lieutenant Hammond had to contend with, a delay of five weeks in starting, the small staff employed, the difficulties in obtaining trustworthy men, decent food and water, much sickness amongst his crew, the heavy weather encountered, and the extremely rough nature of the coast, Lieutenant Hammond has turned out a fairly satisfactory season's work.

I am aware of the many disadvantages under which Lieutenant Hammond would labour in a sailing vessel like the "Constance," but I was not prepared for the series of accidents and impediments reported by him, which, however, appear to have been unavoidable. The outturn of work would always be necessarily small when compared with the cost of keeping up a vessel like the "Constance." I therefore represented the matter to the Government, asking that the vessel be removed from the Department, as she had proved quite unsuited for surveying service.

Lieutenant Hammond's health on his return necessitated an application from him to appear before a medical board, and he proceeded to England on six months' sick leave.

NATURAL HISTORY RESEARCHES.

Although the time devoted to this branch of the survey was unavoidably short this year, yet I think the results were so far satisfactory, as it has become apparent that when we have a more suitable vessel the Natural History branch will by no means make the least valuable additions to our knowledge of the Indian seas. We have indeed been fortunate in obtaining an officer of Dr. Armstrong's ability and zeal, and I trust, bearing in mind the important additions to science which might confidently be expected from a systematic examination of the *fauna* and *flora* of the Indian coasts and waters, that when arranging the internal fittings of the new surveying vessel which the Government of India have ordered from England, the requirements of the naturalist, especially for deep-sea dredging, &c., may not be forgotten.

Dr. Armstrong has, with very scant means and limited time, made a most interesting little collection, for the details of which I beg reference to extracts from his report (*see* Appendix G.)

A. Dundas Taylor, Commander (late I. N.),
Superintendent of Marine Surveys.

A P P E N D I C E S.

(A.)

EXTRACTS from a REPORT on the Ports of BURMA, by Commander A. D. Taylor
(late I. N.), F.R.G.S., Superintendent of Marine Surveys.

CHITTAGONG.

THE British India Steam Navigation Company's Steamer "Mahratta" called at Chittagong on 9th October; Captain Pollock, being well acquainted with all these ports, passed in between the outer channel buoys, but had to wait there for half an hour, whilst the pilot (native) made his slow way on board in a tub of a boat certainly never intended for pulling.

2. I found the Admiralty Chart, No. 84, very defective; Mr. Pearson's latest survey of the river had not been used for its correction. If the Government of Bengal will supply me with a copy of Mr. Pearson's work, a trifling improvement can be made.

3. But the correctness of the soundings near the river Bar is the most important matter. There the chart seems deficient. The British India steamer "Penang" had, a day or two previously, grounded on a shoal (not on the chart) near the south buoy after she had passed out between the buoys. This question should be looked into by a competent surveyor and the south buoy moved out further if shoal water lies beyond it. The fact is that the Admiralty Chart is wrong, and has been wrong for years, and nobody apparently takes the trouble to mention the matter.

4. For the first time I have now been able to discover that the two lights at Norman Point are horizontally apart about 50 yards, and not, as stated in the Admiralty Light List, vertically eight feet apart.

It is said that the two lights appear in line when a vessel is on the line of shoalest water upon the Bar; but the Bar shifts, and it is reasonable to ask the question,—is one of the lights shifted occasionally?

AKYAB.

The Admiralty chart of this place, No. 1,884, is imperfect and rendered treacherous to navigators, because the Bar buoy is now in a position differing from that given on the chart. This circumstance nearly led the "Mahratta" into trouble on a previous visit to this place in the bad weather of August. The rule was, and still exists in sailing directions, to steer for the highest land of Borongo, and when the Bar buoy is sighted, you steer to pass southward of it and then haul up north a little westerly. This course the "Mahratta" initiated; but, when near the buoy, got a cast of $2\frac{1}{2}$ fathoms (little more than her draught). She had to back out and steer to the southward for more than a mile before hauling up north.

On my visit I took angles and bearings and found the buoy to be placed about a mile to N.N.W. of its assigned position on the Admiralty chart, No. 1,884.

I have already reported (*see* letter, No. 211, dated 30th August 1875) the necessity of a survey of the neighbourhood of Akyab. This would satisfactorily determine the position of the new Oyster Reef Lighthouse and set matters right in these parts.

Colonel Ryan, the Commissioner of Akyab, mentioned the difficulties they have there in the absence of any steamer to go off to ships and to place the buoys in position.

When the Oyster Reef Lighthouse is finished, it would be a great advantage to furnish Akyab with a wooden steam-launch (lifeboat) about 50 or 60 feet long, a good sea-boat.

KYOUK PHYOO.

There is no trade to speak of here. The chart is good, and the dangers bordering the fair channel are marked by buoys. It is rumoured that some of these buoys are to be removed. I trust that this may be prevented. With the aid of these buoys a steamer can safely leave this port now on a moon-lit night.

The Terrible Rocks.—The proposal to put a light on these rocks was lately submitted to Government by the Military (Marine) Department, and the question appears to be now several years old. The trade of Kyouk Phyoo does not call for a light there, and its necessity can only be taken into consideration in a general systematic scheme for lighthouses throughout the Bay of Bengal, which I propose to submit soon for the consideration of the Government of India.

BASSEIN.

The chart No. 834 of the approaches to this place is imperfect, and likely to lead ships into danger. The shoal-water around Diamond Island and the Phaeton Shoal has not been properly nor sufficiently sounded and delineated; neither has the anchoring ground lying to the east of the above island. The Northern Channel, leading on round Negrais and Pagoda Point and through to the north of Hingie Island, is reported by the Master Attendant to have shoaled very much of late years, and a ship could *not* follow the existing directions and run in there. But the chart still shows a deep passage; this is highly dangerous, and might lead a vessel to her destruction.

2. The South Red Buoy of the Orestes Shoal (marked on the Admiralty Chart) was more than once or twice washed away. The replacing of it appears to have given trouble, and so now it is not placed there in reality, although shown on the chart.

3. *Danger*.—It is my duty to point out that great danger arises, not so much from removing a buoy, as from the fact that due notice was not formerly given of such removal to the Hydrographer. But it is hoped now that a Government circular may issue to all the marine authorities, informing them of the necessity of constantly reporting to the Superintendent of Marine Surveys any change of position of buoy, beacon, or light.

Again, to allow a deep channel to be shown on the charts where (the fact being locally well known) there is shoal-water betrays negligence or indifference on the part of somebody, which can only be partially palliated by laying the omission or neglect at the door of the incumbent's predecessor—a course adopted by the Master Attendant of Rangoon in the matter of the China Buckeer Light, but a course that should not be allowed. When it is considered that these port authorities are the officials that sit on marine courts of inquiry into wrecks or disasters to shipping, at their own ports or along the coast of the province to which they belong, it may easily be guessed (as pointed out in my remarks upon last year's "Wreck and Casualty Statements," dated 24th July, sent with this office memorandum No. 81, O. M., dated 26th July) how shipmasters are pretty sure to find all the blame falling upon themselves. I shall revert to this subject in another letter upon Rangoon approaches and the survey of the Burma coast.

4. The Bassein river is deep, excellent, and easily navigable. The pilotage question here might be advantageously inquired into. Pilots have shares in a steam-tug, and therefore refuse to take large ships in or out without steam. They can ask what they like. The "Earl of Zetland," a large ship, in October last had to pay 2,200 rupees for being towed up to Bassein, drawing 16 feet, and coming out when drawing 20 feet 6 inches.

5. Going up the river, I found that on the Admiralty Chart the Cockatoo Rocks are shown off the *east*, instead of the *west*, shore. I shall inform the Hydrographer of this, and get the necessary alteration made. I merely mention it to show how little thought has been bestowed upon the amelioration of our charts by men who are well paid for doing something.

RANGOON.

The temporary light-vessel, in lieu of China Buckeer Light, is placed on the Admiralty Chart No. 823 about three miles too far west. This error evidently arose from a lack of perspicuity in the Notice to Mariners issued by the Superintendent of Burma Lighthouses (to which I had occasion to draw the attention of the Government of India in letter No. 153, dated 30th June 1875). And I would here mention that the information sought by me in that letter has never come, and no reply was given to my remarks on that point.

2. The position assigned to the new screw-pile lighthouse, said to have 12 feet at low-water, has three and a half fathoms marked on the chart. If the piles are in 12 feet water really, and the structure has been moved five miles to S.E. by S. $\frac{1}{2}$ S., as stated, it is clear that the old position assigned to China Buckeer Light was in error to the extent of more than one mile. My bearings from the Outer Black Buoy, supposing that to be correctly placed as regards Eastern Grove Light (*see also* paragraph 4), make the above error to be more nearly one mile and a half. This error—at least this supposed error—will soon be substantiated or refuted by the observations that are being made at Rangoon. It may account in measure for two of the British India steamers grounding, with China Buckeer Light bearing N. by W. five or six miles off (*see* Wreck Statement for 1874).

3. The sunken buoy-vessel "Mata Mata" is allowed to lie there about one and a half miles S.S.W. of Fairway Buoy, standing upright on the bottom of the sea; her two masts afford a warning by day, but by night no precautions are taken to mark her position. I have already addressed the Government of India on the subject of the "Mata Mata" in letter No. 282, dated 18th November, to the Under Secretary.

4. The steamer took less time in passing from Fairway Buoy to Upper Black Buoy than was consistent with the distance as shown on the chart, taking the tide also into con-

sideration. On arriving at the Black Buoy, I found that the bearing of the China Buckeer old lighthouse differed a *point* from the bearing on the chart. This difference shows that the China Buckeer old lighthouse (and consequently the newly-erected one on screw piles) is considerably out in latitude. We shall soon now ascertain its real geographical position from the officers of the Great Trigonometrical Survey, who have just fixed it.

5. Although Mr. Pearson's survey of Rangoon river in 1866 was lithographed, the Admiralty Chart No. 834 still retains merely Ward's more ancient survey of 1852. The pilots complain that they are prohibited from using a good channel which was shown by Pearson's survey between Elephant Obelisk and Eastern Grove, and which would materially expedite the passage of ships up the river in the south-west monsoon. They are told by the Master Attendant that it is not an authorised channel.*

6. Several excellent beacons are erected along the banks of this river, but they are not exhibited on the charts, because (as stated in my covering letter No. 285) the marine authorities know not how to fix their positions and place them accurately on the chart.

7. The pilot schooner was anchored about two miles to south-east of the Fairway Buoy, but from this position the light of the temporary light-vessel was not visible to the eye without a binocular glass, although barely six miles off. On inquiry I was told that there was no specially responsible man of the Master Attendant's department on board of that hired vessel (hired consequent on the sinking of "Mata Mata," which was originally advertised as a temporary light-vessel) to see to the cleaning and trimming of the lamps. Two lights in fishing-boats, which I observed lying to the east of the old China Buckeer Lighthouse might easily have been mistaken by a stranger for the temporary light-vessel. Burning a blue light every hour is all that distinguishes that vessel, and it is devoutly to be hoped that the new lighthouse will soon be ready.

8. The bank on the eastern side of the entrance, as shown on the Admiralty Chart, differs immensely from the reality. We went into the Rangoon river in the steamer "Burma," on the last of the ebb-tide (date the 22nd October), right over the bank and very close to the place marked "dry in patches," but had not less than $3\frac{1}{2}$ fathoms.

9. As several groundings and losses have occurred during the last two years in the vicinity of Rangoon, it would be interesting to learn what charts were lying open before the marine courts when they gave verdicts against the shipmasters whose vessels had grounded. Perhaps the Government of India may now feel inclined to call for information on this point.

10. I was rejoiced to learn from Mr. Rivers Thompson, the Chief Commissioner, that the assistants of the Great Trigonometrical Survey at Rangoon were about to determine the exact position of the China Buckeer Light.

MOULMEIN.

This river ought to be better managed than any I have mentioned, because, besides a master attendant, Moulmein has a river surveyor and a buoy-vessel. Steam-tugs are always now used here, and this reduces to a minimum the chance of an accident. Of course the Admiralty Chart No. 1,845 was wrong, for the reasons already given—viz., it has been nobody's business to suggest or effect a periodical rectification of the charts.

2. The master attendant, Mr. Dodd, obligingly lent me the chart of Mr. Pearson's survey, executed in 1865. It appears that this was given in by that surveyor to the Moulmein authorities, with the intimation that it was of no use lithographing the chart, because the channels were sure to alter. Thus, there are (I believe) no copies of this work to be found in Calcutta. Of course such a chart is of little value to navigators, but to a survey department it has an important negative value, similar to Rennel's maps of the Ganges and Brahmaputra, as showing, on comparison with a fresh survey, the secular changes.

3. Mr. Pearson's survey of this river, like those of Chittagong and Rangoon, was very incomplete, owing to the desultory and unsystematic manner then in vogue of doing these works. Several of a surveyor's station-marks should be left, and then the gradual changes of the river-bed can be at any time satisfactorily tested by a few angles. Not a single mark exists along the eastern shore for 20 miles above Amherst, but certainly two or three permanent marks should be left and made over to the charge of the shore authorities for preservation. The hills standing about 200 feet high a mile or two to south-east of Amherst are not represented on any charts, although their peaks form (in combination with the pagodas at Amherst Point) admirable leading marks for the river channel and landfall marks for the coast.

4. As stated above, there is a river surveyor here. If his periodical surveys are worth anything;

* It has since been ascertained that no good channel exists in this locality.

anything, we should have copies sent to our department for incorporation in our charts. Although the entrance of Moulmein river requires to be properly surveyed, and to have (as pointed out above) station-marks left there, so that future surveyors may accurately test the changes, yet the means at my command will not permit a survey there during this season.

CONCLUSION AFTER INSPECTION.

Seeing that as yet no information has been sent direct, in accordance with the Government of India's letter of 11th August 1875, quoted in paragraph 9 of Government Resolution, constituting the Department of Marine Surveys, by any port authorities, local governments, or administrations, to the Superintendent of Marine Surveys in the matter of lights, buoys, &c., it is suggested that the several governments and commissionerships, and the several native principalities bordering on the sea, should be moved to furnish immediately and periodically to the Superintendent of Marine Surveys the following reports:—

2. Announcing removal, or change in position of, or any accidents to, lights, light-vessels, buoys, beacons, &c.
3. Discovery of any shoal or rock, or of any error in any chart.
4. Disasters to shipping to be duly reported, with the supposed causes thereof; and in case of stranding, a report showing what charts and books of sailing directions were in use on board such ship.
5. Each master attendant or port officer to report whether he considers the system of lighting and buoing his port as good as might be.
6. Each master attendant or port officer to furnish the Marine Survey Department with a copy of the pilotage and port rules in force at their respective ports.
7. Statement of the establishment, in men and boats, employed by the master attendant of each port; showing also the system of pilotage (whether Governmental or private), number of pilots and pilot-vessels, tonnage fees, and estimated tonnage of ships clearing outwards and inwards; also noting whether any, and how many, tug-steamers, public or private, are employed.

(B.)

MEMORANDUM by Commander A. D. Taylor on Surveys needed along the *West Coast of India*, forwarded to the Government of India with letter No. 172 of 1875, dated 16th April 1875.

REFERRING to Resolution of the Government of Bombay, dated 28th January 1875 (No. 110, Marine Department), in which the Superintendent of Marine Surveys is invited to state whether he considers it advisable to cause any, and what, surveys to be made along the seaboard of Western India, the following memorandum has been drawn up:—

I.—Ports on the Western Coast, south of Bombay,* including Goa.

Bathul (formerly *Baticolo*), the most southern port of the Bombay Presidency, has only been partially examined, and is shown only on the general sheet of the South Canara Coast on a scale of half an inch = one mile. It must, however, be many years before attention can be given to these minor ports.

Honore, *Coomta*, and *Tuddri* are shown on the coast charts with tolerable accuracy. *Tuddri* is done well on a large scale.

Gungaweli, *Bellikerry*, *Binghi Bay*, and *Anjideva Roadstead*, as ports of little consequence, are sufficiently well delineated for the present trade.

Carwar is well known, but the shifting mouth of the Sedashigar River needs periodical examination; however, the port officer doubtless sees to this. The minor Goanese ports between *Carwar* and *Marmagoa* want more examination, but must wait many years.

Marmagoa River.—The entrance is a complete blank, and it would be well to ask the Portuguese Government to give their assent to the execution, by our trained surveyors, of a careful survey of the *Marmagoa River* entrance, which is one of the west-coast ports of refuge.

Goa Port has not been thoroughly examined, and the only published chart of that place is on the small scale of half an inch = one mile. Perhaps the Portuguese Government might be persuaded to survey their own ports, including *Diu* and *Damaun*. It will be some years before we can undertake any further operations on the *Goa coast*, and the general charts are sufficient for coasters.

Vingorla

* I do not include in this memorandum any of the Madras ports or Travancore.

Vingorla is so important a commercial port, that the anchorage needs to be most carefully surveyed on a large scale. This is one of the first ports on the west coast which call for examination, but I cannot hold out any hopes of its being done for the next two years.

Malwan requires to be minutely surveyed on a large scale; and the clearing-marks for the Malwan Rock and other dangers need to be ascertained and indicated.

Dewghur.
Viziadroog.
Rajapoor.
Ratnaghiri.

The seven ports as per margin have only been partially surveyed. For the greater security of the large steamers now calling there, they require to be thoroughly done on a large scale. This must, however, be a work of time.

Junjera Port, belonging to the Habshi, has never been thoroughly surveyed, but requires to be.

Chawal and *Alibagh* should also be more accurately done.

Bombay Harbour.—There are various internal portions of this harbour that need to be surveyed to supplement the survey by Lieutenant Whish; but his chart is sufficient for the present. It would be a great service if some one with a knowledge of surveying could (in conjunction with the pilots and master attendant) draw up a new set of marks for working out of and into the harbour, making use of the lofty new buildings, which quite eclipse the old marks.

II.—Ports on the Western Coast, north of Bombay, including the Gulf of Cambay and the Ports on the Kattywar Coast.

Gulf of Cambay.—It will be seen (at page 20 of my "Review of Charts and Scheme for Future Surveys") that I consider this as the fifth survey in importance, and to come after that of Sittang River mouth. We now have all the Great Trigonometrical Survey of Kattywar and Goozerat as the groundwork of our new labours. I reckon this survey to commence a few miles southward of the Tapti River mouth, and to extend to a dozen miles westward of Goapnath Point, taking in the Malacca banks. Having the Great Trigonometrical Survey triangulation, we can commence anywhere to survey a portion; and if circumstances (such as a more pressing demand for the services of the surveyors elsewhere) should necessitate breaking off work there, it could be easily taken up again.

With the view of meeting the wishes of the Superintendent of the Bombay Marine, I made a suggestion, in paragraphs 4 and 5 of my letter No. 8, dated Bombay, 3rd February 1875, about employing two Royal Navy officers in surveying the neighbourhood of Kantiajal Creek, with certain means which had been previously arranged by Captain Robinson at an estimated cost. On 23rd February I telegraphed from Calcutta that two trained surveyors could then be sent. Their employment at that time would have been an advantage, but for a more extended survey of the Gulf of Cambay, which should include the Kantiajal Creek, I think we shall probably have to wait three years.

The foul ground off Danoo is the principal portion requiring examination between Bombay and Surat; it is a rocky and dangerous place, but properly avoided on that account. I think, therefore, that nothing will be lost by postponing its examination till the Surveyor-General's operations have extended to that coast.

Agansee and other minor ports may soon demand a more accurate survey.

Damaun, belonging to the Portuguese, is a port that deserves to have a chart on a good-sized scale.

Omersari
Bulsar.
Nowasari.

These three ports, as per margin, and the mouth of the Sucheen River, will call for examination at some distant date.

Koonbunder.
Baoliari.
Soondri.
Bhaonaga.

The mouths of the Tapti, Narbada, Mhye, and Sabarmati are so changeable, that unless annually examined and corrected, their charts would only mislead; and such annual examination would be too costly. They will come in with the Gulf of Cambay survey, which will also include the ports as per margin.

Gogo Roadstead has never been thoroughly surveyed, and should some day be well done by means of a steam-launch.

Shalbet anchorage.
Jaffrabad.
Diu.

Varawal.
Porebunder.
Dwarka.

The same remark applies to the ports as per margin. I have found Captain Grieve's original large scale triangulation survey of the Kattywar Coast amongst the 3,000 old charts condemned to be burnt.

I hope in the course of this year to produce better charts of Kattywar for the use of navigators.

The Gulf of Kutch has ports that may soon require more detailed surveys when coasting steamers call there. The most important are *Seraia* and *Nowa Naga*. *Beyt* may hereafter require a closer examination than was made by me in 1852, but the Admiralty Chart of that place does well for the present.

Mandavee.—

Mandavee.—We have found an original large-scale plan of this place, which may be published on the coast sheets; but, some years hence, Mandavee should be re-surveyed.

The Mouths of the Indus.—Periodical examination of the increasing and shifting banks off the principal mouths of the Indus will have to be made about every ten years; but as this year's survey will not do for the next year, it will be best to warn vessels off that coast.

(C.)

REMARKS by Navigating Lieutenant *G. C. Hammond*, R.N., Assistant Superintendent, 1st Grade, Marine Survey of India, on the LIGHTING of the PORT of Cocanada, dated 19th September 1875.

IN reference to the wishes contained in your letter, No. 156, of 1st July 1875, respecting the lighting of the port of Cocanada, I beg to submit the following for your consideration:—

I will answer your questions *seriatim*, as contained in your letter:

- A.—Q. Whether new light or lights are necessary?—A. Two new lights are required.
- B.—Q. If so, whether lighthouse, pile-light, light-vessel, or both?—A. Both lighthouses.
- C.—Q. What order, description, and elevation?—A. Point Gordeware light should be of the first order dioptric, showing a distance of 21 miles at an elevation of about 170 feet; and Cocanada Harbour light should be of the third order dioptric, showing a distance of 10 miles at an elevation of about 70 feet.
- D.—Q. The exact position to place either, or both?—A. Point Gordeware light should be placed just inside high-water mark on the projecting part of the point bearing from the present Hope Island light S. 20 E., and at a distance of 4.7 miles.
- Cocanada Harbour light should be at 4.68 miles N. 22 E. from the present lighthouse.

My reason for naming a spot so far to the southward for the Gordeware Point light is, that it might be made use of as a "landfall" light for ships working up or down the Bay of Bengal; and that it might be utilised also to point out the Sacramento Shoal, which would then lie about 16 miles in a S.S.W. direction (the bearing and distance approximate, as it has not yet been surveyed), a red shade being inserted on the danger bearing; by using a similar shade, throwing the light between the bearings N. by W. to N.N.E., would assist a vessel in keeping clear of the N.E. part of the Spit, as the latter bearing cuts the present 10-fathom contour abreast the Outer Buoy.

Not having any boring tools, I am not in a position to give the nature of the ground for a foundation; but I found sand to a depth of about six or seven feet, and I think the stone, &c. necessary, both for a foundation and the lighthouse itself, might easily be obtained a short distance up the River Godavery, a branch of which runs close at the back.

At this point also the water appears to run out shoal for a considerable distance, no doubt in bad weather causing a considerable sea. From information I gathered from the lighthouse-keeper at Hope Island, ships have, several times, reported a separate shoal some two or three miles off this position of the coast; but from observations I made on the beach, and again from the summit of Hope Island light, I could see nothing detached, and I think the reports must have arisen from the vessels having been too close in-shore to the southward, and having seen the broken water off this point: therefore, a light in this position would greatly assist a vessel in keeping clear of any danger lying off.

My reasons for thinking a shore-light will be the best for Cocanada are—

1st. If it is constructed with an iron-pile framework, it can easily be moved as the bay fills up; and, being on shore, it will not have the extra risks which a light-vessel would have to encounter, such as vessels fouling her, or being driven from her moorings.

2nd. It will eventually cost less than a good light-vessel.

3rd. I think at the position marked on my plan an excellent foundation will be found, besides allowing plenty of room for the keepers, dwellings, storehouses, &c.

This light also might be fitted with a coloured shade, to enable a vessel to keep clear of the north part of Gordeware Point—viz., from S. 51 E. round to the southward, the point having grown out in a N. E. direction during the last 29 years about two miles, one mile and a half of which has accumulated since your survey in 1857. I think it would be advisable that the coloured shade should be made to shift if necessary, in order that, as the point grows out to the northward, the bearing of the coloured light might be altered also.

With such a light as mentioned above, I venture to think the convenience of the port

would be better served than by having a pile-light, as suggested by Colonel Fraser, R.E. (I have marked in my plan the position suggested for the pile-light, as shown to me by the lighthouse-keeper at Hope Island), or a light-vessel, as suggested by Mr. Robertson, harbour engineer.

My objection to a pile lighthouse in such a position is, the tremendous action of the breakers, with an on-shore gale, against such a structure, taking into consideration the undertow and the foundation, which, I think, would not be found very good; and, again, it would have to be shifted to the N. E. as the land grew out in that direction, or otherwise it would eventually be somewhere inland, like the present Hope Island light, and consequently would become as useless.

With respect to a light-vessel, I see only one thing in its favour, and that is, it would be cheaper in the long run; against such a light there are several grave objections, viz. :—

If it should be moored to mark the north end of Point Gordeware in five fathoms (somewhere near the present inner harbour buoy), it would have to contend with a very nasty, short, choppy sea, caused by the freshes (at this time of the year) coming out of the Godavary, meeting the wind and sea brought up the coast by the S. W. monsoon; and again, vessels standing in or out have to keep their luff, and shave the point as close as possible, to avoid being set to leeward, thereby entailing a chance of fouling.

I think a light-vessel, moored in such a position, would be safe, as far as holding is concerned, even in a cyclone; the only danger being her parting, occasioned by a sudden jerk on the cable, owing to the heavy sea which would then be running. I am told the worst quarters from which it blows are N.E. and S.W. If she parted, with the wind at N. E., she would drift in, about W.S.W., through very soft mud, which would also act as a sort of breakwater; and if it came from the southerly quadrant, she would be blown out to sea.

Again, if the light-vessel was moored somewhere in the middle of the roadstead, I am afraid it would occasionally be taken for a ship at anchor, thereby rendering it nearly useless as a light-vessel, and it would still run the chance of being fouled.

I am afraid I can give you very little useful information respecting Cocanada Bay as a holding-ground in a cyclone. I only heard of one casualty from such a cause, and that occurred some 15 years since to a native craft, and the accepted idea is, she was lost through defective ground-tackle. It is said there is very little sea except off the Spit, considering what one would expect on a lee-shore in a cyclone; and the best thing a ship can do is to give a good scope of cable, and drop a second anchor under foot, and then let her drag through the soft river-mud, which comprises the bottom of the bay; by so doing, a properly equipped vessel, with a decent crew, ought not to come to any great harm, except in the case of small vessels, which generally get everything swept off their decks. Hoping that my remarks on the lighting of the port of Cocanada will meet with your approval, &c.

(D.)

REPORT upon certain Proposals for a Reorganisation of the RIVER HOOGHLY SURVEY, drawn up by Commander A. D. Taylor, late I.N., Superintendent of Marine Surveys (dated the 19th February 1875).

1. AN elaborate and scientific survey of the whole tidal basin of the Hooghly River, or at least from Chandernagore to the Sandheads, is most certainly required, and should be executed as soon as possible. Indeed, it is a great pity that the recommendations of the Committee of 1854 were not acted upon—viz., that “*minute and periodical surveys of the whole length and breadth of the river from Calcutta to the sea are necessary*,” because the charts of the present survey were found “*altogether insufficient for engineering purposes*.”

2. More than 20 years have passed away, and we have still to deplore the omission of any such scientific survey. We are left to guess what changes may have taken place, and the causes of those changes. Shall we bequeath to another generation this important work, and our regret that it had not been begun many years previously?

3. The unscientific method of the existing river survey, the counterpart of that which was executed by Captain R. Lloyd, of the Indian Navy, nearly 40 years ago, with its imperfect *matériel* and rough *personnel*, and consequently unreasonable cost, is denounced by any hydraulic engineer who comes in contact with such primitive work. “The resulting charts are altogether insufficient for engineering purposes, and will be of little or no assistance hereafter in determining the causes of change or deterioration in the river.”

4. I have no desire to depreciate the labours of the river surveyor, which are confined to ascertaining and recording the navigable channels. I believe his work to be executed on the basis and principles adopted by the old Indian Navy surveyors when taking the off-shore soundings along a coast and in the harbours of Asia. But those surveys were merely preliminary. We now know that for accurately delineating river-channels nothing but sectional sounding in steam-launches will suffice. Drifting about in a row-boat at the caprice of the tidal stream, and dependent upon the varying speed attainable by

by a dozen weak rowers or a fitful wind, the cleverest marine surveyor could not produce work that would stand the criticism of a practical harbour engineer.

5. With such convictions it becomes my duty to declare that I cannot endorse the opinion of the officiating Master Attendant in paragraph 5 of his letter, No. 4219, dated 2nd July 1875, to the Government of Bengal. The state of the channel, sands, and bed of the river cannot be ascertained by "trigonometrical measurements" made annually and from time to time. Measurements to ascertain the configuration of the foreshore, leaving *pucka* bench-marks by levelling all the way from above Calcutta to at least Diamond Harbour, should be accurately made once for all, embracing as shore-marks all lighthouses, flagstaves, beacons, obelisks, temples, houses, and remarkable objects; whilst other permanent station-points, boundary pillars, and tidegauge stations should be left near the river margin and on some of the large sandbanks which are uncovered at high-water of neap-tides.

6. The assertion that the present surveys are "*all that can be desired for information, so far as the bed of the river, its channels and sands are concerned, either for engineering or navigating purposes*," cannot be accepted as correct in the face of the following fact. *The inclination of the bed of the Hooghly River has never* yet been determined, and can only be determined by an accurate series of levels taken from above Calcutta to below Diamond Harbour (say, to Rangafulla). Proper measures for determining this slope of the river bed must be adopted before any design for improvement can be formed, and (I would add) before the soundings taken can be properly reduced to any correct datum levels.*

7. Tidal observation stations are now few and far between. The soundings taken (for instance, between Diamond Harbour on the one shore and Diamond Point on the other), whether reduced by the Hooghly Point's tidegauge or by that of Middle Point below Rangafulla Obelisk (which gauges are 20 miles apart) will differ several feet. *Intermediate stations for tidal observations must be multiplied to ensure anything like accuracy in our plans of the river. At stations several miles apart, the times of high and low water will surely be found to vary much, the difference being due at times more to the state of the wind than to the fact of the tides being neap or spring.*

8. I would ask the Government of India to inspect the chart of the survey of the James and Mary Shoals, executed between mid-April and mid-May of last year by the officers of the "Guide," and to compare it with any of the river surveyor's charts of the same spot. Soundings can only be correctly taken *sectionally* in a river, after erecting section poles. With such poles, placed as fixtures abreast of channels where frequent changes take place in the bed of the river, these sectional soundings may be repeated day after day or week after week, and changes in the channels immediately made known to the pilots. This is what the pilots want. And for this purpose I highly approve of Mr. Chitty's proposal to have a central office for completing the plotting and drafting of charts by the surveyors at Diamond Harbour.

9. The proposals of Mr. Chitty and the Port Commissioners both indicate the importance and necessity of having distinct surveying services for the portions of the river *above and below* Diamond Harbour. The one is purely river work, the other is distinctly sea work. Not having had the opportunity I expected of going down river in the "Celerity," to make more inquiries on the spot, I see nothing at present to modify the view of the question which I have entertained for some weeks past—*i.e.*, that a combination of the schemes proposed by Mr. Chitty and the Port Commissioners commends itself.

10. The officiating Master Attendant says (paragraph 13) "*steam-launches are of little or no use below Diamond Harbour, except in the very finest weather.*" But Mr. Chitty defines the kind of steam-launch he would employ in paragraph 4 (f) of his letter, dated 26th January 1871, as "*capable of going to Saugor anchorage in the south-west monsoon*," and having "*comfortable arrangements for surveying officers forward.*" Two steam-launches of that description would, in my opinion, amply suffice, along with the steam-buoy vessel and surveying vessel combined of about 300 tons (*see* paragraph 11 of Port Commissioners' scheme, dated 17th April 1875), to do all the sea section surveying work, *without* the first steam river-surveying vessel, as stated to be required by the officiating Master Attendant and River Surveyor in the letter of Bengal Government (Marine), No. 449, dated 12th February 1875.

11. It is presumed that the "Celerity" will still be available to assist in the work pointed out by the officiating Master Attendant in paragraphs 16, 17, and 18 of his letter No. 4219, dated the 2nd July 1875. If the "Celerity" be available, I venture to think that the large steamer of 250 tons would not be required, and I state this with a full knowledge of what is said in paragraph 18 (just alluded to), that "*there can be no hope of this additional duty being accomplished with a flotilla, as suggested in the Port Commissioners' scheme.*"

Amongst

* A series of levels has since been taken and bench-marks left by the Irrigation or Revenue, Survey Department.

12. Amongst the correspondence concerning the River Hooghly survey, I find that the Government of Bengal has represented to the Government of India (*see* letter No. 561, Marine, from the Secretary of Bengal Government, dated 22nd February 1875) the absolute necessity of having a *second* steam buoy vessel and surveying vessel combined, for the purpose of the buoyage of outports under the Government of Bengal. I am therefore decidedly of opinion now that two such steam buoy vessels will best subserve the interests of both the surveying and buoying work for the Hooghly and outports, and that the proposed steamer of 250 tons would then be a superfluity.

13. I think it would be well that a committee of practical land and marine surveyors should go into this subject before a final decision be made as to reorganisation. But the important preliminary work which I have indicated in paragraphs 5 to 7 should certainly be commenced and carried out at once by land-surveyors. Much advantage will result from having it done before the vessels are ready to undertake the sounding.

14. In conclusion, I would observe that the printed statement of the Port Commissioners, showing the "present and proposed scale of establishment," seems carefully and correctly drawn up, and their proposed vessels would be competent to perform the two sections of survey work which I have indicated in paragraph 9 above.

(E.)

REMARKS by Navigating Lieutenant *F. W. Jarrad*, R.N., Deputy Superintendent of Marine Surveys, 2nd Grade, on the LIGHTS and BUOYS in the Approaches to RANGOON RIVER, dated 29th May 1876.

WITH reference to the light at Eastern Grove—this light is visible between North and N.E. by E. $\frac{1}{4}$ E.; it, however, is supposed to show more brilliantly, over an arc of 10° , between the bearings of N.N.E. and N.N.E. $\frac{1}{4}$ E. nearly, for the purpose of indicating the fairway channel; but the increase in brilliancy is so very gradual as to render it impossible to define the limits of the arc of greatest brilliancy with any certainty. I would, therefore, suggest that the light should be coloured red over the Eastern and Long Sands, that is, between N. and N. by E. $\frac{1}{4}$ E., and also over the Spitsand, that is, between N.N.E. $\frac{1}{4}$ E. and N.E. by E. $\frac{1}{4}$ E., leaving a bright white light between, over an arc of 10° , to indicate the fair channel. A vessel then approaching the banks on either side would, immediately on seeing the light change colour, become aware of her danger. At present, as I have already stated, the change from a bright light to a brighter ray is not sufficiently apparent to be of any practical utility for giving warning of a vessel's proximity to danger.

If the above proposal were carried out, the Eastern Grove light could then be utilised as a leading light for vessels leaving the river; otherwise it is of very little value, as, now that China Buckeer light has been placed in its new position, the China Buckeer light becomes the landfall light for Rangoon river.

2. With reference to the light on China Buckeer flats:—

The western limit at which the China Buckeer light is at present cut off allows the light to show over the banks off the mouth of the *To-Kwa* (China Buckeer) river. This may lead a vessel into danger, more particularly until the exact limits of the light are universally known. I would recommend that the limit be altered to N.E., instead of N.E. by E. $\frac{1}{4}$ E. Had a careful survey of the locality been made before the position of the China Buckeer light was decided on, it would have been apparent that it should have been placed one mile farther to the south-west than it now is. A vessel then making the light and steering for it could not, as long as she kept it in sight, get into danger.

With the present arc of visibility, should a vessel approach the light on a bearing east of N.N.E. $\frac{1}{4}$ E., she would be in great danger of taking the ground on the sandbanks to the south-west of the light. I would also draw attention to the fact that, apparently, the Marine Survey Department was not referred to for an opinion on the subject before the new position of the light was fixed upon, or the arc of visibility determined.

3. With regard to the buoying, I have noticed that no uniform system of buoyage appears to be carried out in India; and I beg leave to draw your attention to the great disadvantage of placing buoys in a channel the colour and construction of which do not at a glance convey an idea of the general nature and position of the dangers which they mark. I would therefore suggest that a uniform system of buoyage should be introduced, assimilating as nearly as possible with that used by the Corporation of the Trinity House, London, and that this system should be compulsory in all ports and rivers of British India.

4. With the above object in view, I respectfully suggest the following alterations being made in the character, &c. of the buoys at the entrance to Rangoon river:—

(a) That the present Fairway Buoy be called the "Outer Buoy" (as it undoubtedly is), and that the name "Outer" be painted on it.

(b) That

(b) That the present Outer Buoy be called "Fairway," it being placed in the Fairway Channel, and the name be painted on it as above: both the buoys, as well as the Spit Buoy, should be conical in shape, and larger than those now in use.

(c) Referring to the accompanying tracing,* it will be seen that the position marked A, close to the edge of the Long Sand, requires to be buoyed. It is one of the most dangerous spots in the channel; several vessels have been lost there, and the hull of one is still to be seen at low-water. I would therefore propose that an additional buoy be placed in the channel to mark this spot.

(d) The present position of the Northern Black Buoy is not a good one, as it leaves the edge of the shoal-water in the narrowest part of the channel unmarked. I would suggest the desirability of shifting this buoy to the position marked B.

(e) I also propose that the northern red buoy be shifted to the position marked C; at present it is too close to the Spit Buoy to be of any use.

5. Before making the above alterations in the buoys, I would urge the necessity for at once deciding on a system of buoyage, as before mentioned.

(F.)

EXTRACT from a LETTER of Proceedings from Navigating-Lieutenant *F. W. Jarrad, R.N., F.R.G.S.*, Deputy Superintendent, Commanding *I. G. Surveying Steamer "Clyde,"* describing the Coast between *Akyab* and *Cheduba Island* (dated Calcutta, 10th May 1876).

1. ON the 1st of April the surveying work received a sudden check, caused by the appearance of cholera on board the ship, resulting in the lamentable death of Sub-Lieutenant C. George, the particulars connected with which were reported in my letter, No. 89, dated 4th April.

2. Several of the officers and men were attacked with similar symptoms, and to prevent, as far as possible, the epidemic spreading, a camp was formed on shore for the greater part of the crew. The ship was fumigated and cleaned throughout. As soon as Dr. Armstrong pronounced it safe, the men returned on board, and after filling up with coal, &c., I left on the 10th April, in accordance with the instructions conveyed in your letter, dated 5th April, for a cruise to the southward.

3. From the 10th to the 14th the ship was sounding and dredging between *Akyab* and *Cheduba Island*. I also took the opportunity of testing the accuracy of the chart between *Kyook Phyou* and *Cheduba*, and found that the coast, as shown on Admiralty Sheet, No. 821, is out of bearing. There was also evidence of a considerable change having taken place in the depths in the channel between *Cheduba* and the *Ramree Island* since the last survey. The weather was not fine enough, neither did time admit of my making any close examination for the purpose of correcting the above very visible inaccuracies. The whole of this coast requires to be re-surveyed in a rigorous manner, and for this purpose a more suitable and better-equipped vessel, and also a more efficient staff than that on board the "*Clyde*" at the time, would be necessary.

4. On the 13th the ship was dredging the whole of the day close to the *Terrible Rocks*. The heavy westerly swell which we experienced on this coast during the whole of the month prevented my landing on either of the groups. I am, however, of opinion that should the necessity for a light on these dangers arise at any future time, the *North Terrible* would be the best site, as it is more easily accessible, and a vessel could anchor nearer to it than she could to the south group. It would appear, however, that at present the necessity for a light in the *Terrible* does not exist, as there is hardly any traffic in their vicinity.

5. The weather was so threatening on the night of the 13th, that I deemed it advisable to seek shelter, and I therefore steamed into *Southampton road*, *Kyook Phyou*.

6. On the 14th the weather still looked wild, and there was a very heavy swell from the westward, preventing any possibility of my landing on the *Terribles*; and as I had found the main points on Admiralty Chart No. 821 so relatively out of position as to preclude any possibility of my plotting deep soundings on it in a satisfactory manner, I so far departed from your instructions as to relinquish the sounding, and determined on examining the harbour of *Kyook Phyou*.

7. Between the 15th and 24th this examination was proceeded with, the main triangulation of the harbour was obtained, the buoys fixed, and the *Bombay* and *Reliance* shoals examined. I am plotting this on a dry proof of the published plan, and when it is completed, shall be able to inform you whether the coast and main points on the present plan are delineated with sufficient accuracy so as to necessitate only the re-sounding the port, or whether the whole plan requires reconstructing. Should the latter prove necessary, I can at once prepare the sheet. Information regarding the position of the buoys, &c., I have already furnished to your office.

8. Dr. Armstrong will furnish a *résumé* of the dredging operations. I believe new species of crustaceans and also shells have been found.

9. On the 24th I called at Akyab for letters, and left, in accordance with your instructions, at daylight on the 25th for Calcutta, arriving here on the 28th; *vide* my letter, No. 93, dated 28th April.

(G.)

EXTRACT from the REPORT of Surgeon *J. Armstrong*, B.A., Indian Medical Department, Surgeon and Naturalist to the Marine Survey of India.

1. THE present Report is intended to be merely an outline sketch of the operations undertaken during the season in connection with my duties as naturalist attached to the Marine Survey. I propose to give only a general idea of the nature of the ground over which the work of the season extended, and I will not attempt, therefore, in this place to give any technical classification or description of the fauna of any portion of the different districts which were visited. A detailed account of the genera and species met with is in course of preparation for publication in the Asiatic Society's Journal, and will shortly appear therein.

2. All the shells which were collected during the season have been handed over to Mr. Nevill, of the Indian Museum; while the entire collection of crustaceans, which form one of the most numerous and interesting groups of animals belonging to the marine fauna, has been placed at the disposal of Mr. Wood-Mason for identification and description, that gentleman having long made this branch of the invertebrates his special study. I have reserved to myself all the ornithological specimens, as well as all the hydroid zoophytes which have been collected, and trust soon to complete a description of the most remarkable of these interesting groups.

3. During the months of December, January, and February, our work was necessarily confined to the vicinities of the Rangoon River, between the Grove Lighthouse on the east, and China Buckeer on the west, embracing altogether a coast-line of about 30 miles in extent. The marine zoology of this region is extremely scanty: the great rapidity of the tides, the brackishness of the water, and the enormous amount of mud and fine sand which is held in suspension by the water, and is constantly being deposited by subsidence on the bottom, are the factors which most powerfully co-operate to prevent the development and retard the growth of the marine fauna in this district. The littoral fauna, on the contrary, is abundant. Numerous species of crabs and other crustaceans are to be found along the beach and in the tidal swamps which border a portion of the shore, while the broad and extensive mud flats, which at low-water are left uncovered, afford choice feeding-ground for multitudes of shore-birds of different species—such as *Squaterola Helvetica*, *Charadrius longipes*, *Ægialitis Geoffroyi*, *Ægialitis mongolicus*, *Ægialitis cautiannus*, *Ægialitis Philippensis*, *Lobivanellus goensis*, *Edicnemus crepitans*, *Terekia cinerea*, *Numenius arquatus*, *Numenius phaeopus*, *Tringa subarquata*, *Tringa minuta*, *Tringa platyrhyncha*, *Eurynorhynchus pygmaeus*, *Actitis hypoleucos*, *Totanus glottis*, *Totanus calidris*, and others, including a hitherto undescribed species of *Totanus*. Of each of these specimens have been secured and preserved.

4. Commencing at about two miles to the westward of Elephant Point, and reaching up to China Buckeer river, the coast is fringed by mangrove and tidal jungle, amongst which *Sonneratia apetala*, *Ceriops Roxburghiana*, *Clerodendron inerme*, *Hibiscus tiliaceus*, *Acanthus ilicifolius*, *Derris scandens*, *Flagellaria indica*, *Grewia microcos*, *Glycosmis pentaphylla*, *Basella alba*, *Jasminum scandens*, &c., are most conspicuous. A little inside this tidal jungle, and separated generally by open waste ground, are broad belts of savannah forest running more or less parallel with the shore, and in many places quite impenetrable by reason of thick thorny underwood. These belts of forest trees and thorny underwood give shelter to numerous birds, amongst which various species of parrots, woodpeckers, and drongoes, as well as pigeons and doves, are the most characteristic, while the mangrove jungle bordering the shore swarms with different varieties of herons, and glitters with the gorgeous plumage of kingfishers and bee-eaters.

5. In March we left Rangoon and proceeded to Akyab, sounding and dredging several times on the way, and with results which, on the whole, were very satisfactory. Off Cape Negrais, on each occasion upon which the dredge was used it was brought up filled with a slate-coloured tenacious mud, amongst which a single rare crustacean (*Raninoides laevis*) was found, as well as large quantities of dead pteropods of different kinds. In the more immediate vicinity of Akyab the ground was much more prolific, and abounded in numerous species of echinoderms and crustaceans; several rare and beautiful hydroids and other zoophytes were also obtained.

6. Long before the contemplated work at Akyab was completed, an outbreak of cholera on board, resulting in the death of one of the officers, made it necessary to leave that port, where the disease was at the time epidemic, and it was then intended to devote some little time to dredging in the vicinity of Cheduba and in the neighbourhood of the Terrible Rocks. Unfortunately, however, in consequence of unfavourable symptoms appearing

appearing in the weather, it was found impossible to carry out the dredging operations to the extent which had been originally intended, but, nevertheless, enough was done to show that this entire region is extremely rich in many interesting forms of animal life, and would well repay a more careful examination at some future time. While dredging in the vicinity of the Terrible Rocks, it was found that there is in this region a remarkable formation of bottom, in which, though unaccompanied by any change in the depth of the water, there is an abrupt transition from rock and gravel to a slimy oozy mud, indicating probably the existence of some localised submarine current.

7. I deem it my duty to bring prominently to notice that, having regard to the working capacity of the Natural History section of the Marine Survey, it is quite impossible to carry into execution the scheme of deep-sea dredging which was originally proposed by the Council of the Asiatic Society, and which has received the cordial sanction of Government. Without machinery of any kind, or any steam-power available for hauling in sounding or dredging gear, it is quite useless to attempt to dredge at any depth exceeding 90 or, at the outside, 100 fathoms, and thus valuable opportunities are lost of making any systematic or serial observations upon the various currents and temperatures of the Indian seas, or of investigating the physical character of the sea-bottom.

8. All available time has therefore of necessity been devoted to the investigation of the zoology of the shallower water; but even in this limited field, owing to the short time at our disposal for the work, and the consequent desultory and disconnected nature of the observations made, a maximum of useful work has not been effected.

9. I would accordingly venture to suggest that opportunities may be afforded for a more systematic and definite zoological investigation of the shallower water than was practicable this season, and, with this object in view, I would recommend that a certain definite period, of not less than seven days in each instance, should be devoted to a careful zoological examination of each district where the surveying operations are at the time being carried on, the length and choice of time being left entirely to the discretion and convenience of the commanding officer. In this way the zoological faunas of definite areas would be tolerably correctly ascertained, and much more valuable results might be expected from such methodical working than from isolated and disconnected dredging carried on at more or less remote distances from each other.

(H.)

SYNOPSIS of the Result of the OBSERVATIONS made for determining the MERIDIAN DISTANCE between *Elephant Point (Obelisk)*, *Rangoon River*, and *Amherst Point Pagoda (Flagstaff)*, between the 22nd February and 2nd March 1876.

	STANDARD.		A.		B.		C.		D.		E.		F.	
	H. M.	S.	H. M.	S.	H. M.	S.	H. M.	S.	H. M.	S.	H. M.	S.	H. M.	S.
Errors at Elephant Point on 22nd February 1876	6 19	30.615	0 34	31.385	5 27	59.885	5 03	26.615	4 31	57.115	4 03	41.115	2 39	57.115
" " 2nd March 1876	6 19	06.833	0 35	41.617	5 28	06.617	5 04	47.383	4 31	09.883	4 02	12.883	2 38	32.383
Rate in 9 days (Harbour and Travelling)		23.782	1	10.232		0.6732	1	20.768		27.232	1	28.232	1	24.732
Harbour rate in 5 days		15.573		39.072		03.572	0	47.428		27.072	0	49.072		48.072
Travelling rate in 4 days		10.209		31.160		3.160		33.340		20.160		39.160		36.660
Daily travelling rate		2.552		7.790		0.790		8.332		5.040		9.790		9.165

Meridian Distance from Elephant Point Obelisk to Amherst Point Pagoda.

Errors at Elephant Point on 22nd February 1876	6 19	30.615	34	31.385	5 27	59.885	5 03	26.615	4 31	57.115	4 03	41.115	2 39	57.115
Two days' travelling rate		-5.104		+15.580		+1.580		+16.664		-10.080		-19.580		-18.380
Errors on 24th February (brought up)	6 19	25.511	34	46.965	5 28	00.465	5 03	43.279	4 31	47.035	4 03	21.535	2 39	38.785
" " at Amherst Pagoda	6 24	20.597	29	52.403	5 23	05.903	5 8	40.097	4 36	42.097	4 8	16.597	2 44	33.597
Meridian distance	4	55.086	4	54.562	4	55.562	4	56.818	4	55.062	4	55.062	4	54.812

Meridian Distance from Amherst Point Pagoda to Elephant Point Obelisk.

Errors at Amherst Pagoda on 29th February	6 24	07.025	30	31.475	5 23	09.475	5 09	27.525	4 36	15.025	4 07	27.525	2 43	45.525
Two days' travelling rate		-5.104		+15.580		+1.580		+16.664		-10.080		-19.580		-18.380
Errors on 2nd March (brought up)	6 24	01.921	30	47.055	5 23	11.055	5 09	44.189	4 36	04.945	4 07	07.945	2 43	27.105
" " at Elephant Point	19	06.883	35	41.617	5 28	06.617	5 04	47.383	4 31	09.883	4 02	12.883	2 38	32.383
Meridian distance	4	55.033	4	54.562	4	55.562	4	56.806	4	55.062	4	55.062	4	54.812

Meridian Distance from Elephant Point to Amherst.

STANDARD	H. M.	S.	H. M.	S.
A	0 4	55.086	0 4	55.038
B	0 4	54.562	0 4	54.562
C	0 4	54.562	0 4	55.562
D	0 4	56.818	0 4	56.806
E	0 4	55.062	0 4	55.062
F	0 4	54.812	0 4	55.062
Mean Meridian distance	0 4	36.964	0 4	38.904
	0 4	55.280	0 4	55.272

Meridian Distance from Amherst to Elephant Point.

STANDARD	H. M.	S.	H. M.	S.
A	0 4	55.038	0 4	55.038
B	0 4	54.562	0 4	54.562
C	0 4	55.562	0 4	55.562
D	0 4	56.806	0 4	56.806
E	0 4	55.062	0 4	55.062
F	0 4	55.062	0 4	54.812
Mean Meridian distance	0 4	38.904	0 4	38.904
	0 4	55.272	0 4	55.272

Rangoon River,
4th March 1876.

F. W. Jarrad, Navigating Lieutenant R.N.
Commanding I. G. S. S. "Clyde."

(I.)

STATEMENT showing the COST of the MARINE SURVEY DEPARTMENT from the
1st April 1875 to the 31st March 1876.

PARTICULARS.	Amount of each Item.	Total of each Heading.
	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>
Superintendent of Marine Surveys - - - -	21,600 - -	
Superintendent, Drawing Branch - - - -	7,959 10 11	
Office of Superintendent of Marine Surveys - -	4,325 13 2	33,885 8 1
Contingent Charges :		
Travelling expenses on inspection journeys - - -	1,293 - -	
Contingencies - - - - -	3,089 10 6	4,382 10 6
Scientific Officers :		
Scientific Officers - - - - -	44,965 9 3	
Allowance to one Surveyor as Draughtsman - -	600 - -	
Medical Officer and Naturalist - - - -	4,800 - -	
House-rent to Officers - - - - -	6,298 7 2	56,664 - 5
Executive Officers :		
Executive Officers - - - - -	7,295 7 10	7,295 7 10
I.G.S.S. "Clyde."		
Wages of Crew - - - - -	18,440 7 9	
Contingencies - - - - -	1,327 15 -	
Provisions - - - - -	1,995 11 -	
Stores - - - - -	3,461 2 9	
Repairs - - - - -	2,136 - -	
Coal - - - - -	2,713 12 -	
Travelling expenses of portion of "Clyde's" crew to Bombay.	976 4 -	31,051 4 6
I. G. Schooner "Constance."		
Wages of crew* - - - - -	13,212 11 3	
Contingencies - - - - -	1,016 8 -	
Provisions - - - - -	1,924 7 10	
Stores - - - - -	3,140 - -	
Repairs - - - - -	496 - -	
Coal for steam-cutter attached to "Constance" - -	167 - -	19,956 11 1
I.G. Brig "Guide."		
Wages of crew - - - - -	7,458 9 4	
Contingencies - - - - -	433 2 -	
Provisions - - - - -	608 - -	
Stores - - - - -	1,695 - -	
Repairs - - - - -	1,257 - -	11,451 11 4
I.G.S. "Lady Lawrence."		
Wages of Crew - - - - -	968 6 8	
Contingencies - - - - -	16 - -	
Repairs - - - - -	98 - -	
Steam-cutters.		
Coal - - - - -	20 - -	
Repairs - - - - -	982 - -	1,082 6 8
		1,002 - -
GRAND TOTAL - - -		1,66,771 12 5

* Pay of Executive Officer is not included in this.

A. D. Taylor,
Superintendent, Marine Surveys.

(J.)

PROGRAMME of WORK to be undertaken by the MARINE SURVEY DEPARTMENT during the ensuing season of 1876-77. (Extract from letter, No. 476, dated 28 June 1876.)

The "Clyde" to leave Calcutta on 1st November for Amherst (Moulmein river), calling *en route* at Diamond Island (Bassein river), for the purpose of obtaining observations to enable a meridian distance to be measured between the above island and Amherst Point Pagoda. This will connect, astronomically, Diamond Island, Rangoon (Elephant Point Obelisk), and Amherst Pagoda—the three principal positions in the Gulf of Martaban about which there is uncertainty, whereas correct meridian distances are essential to the reproduction of a new chart of that locality.

2. On arriving at Amherst, I propose that a survey of the approaches and entrance to the Moulmein river be executed on a scale of 2·5 inches to the nautic mile. The present chart of Amherst and the Moulmein river entrance is from a sketch executed by Lieutenant Fell, I.N., so far back as 1842. It is so incorrect as to be quite inadequate for the present requirements of, if not dangerous to, navigation; and after personal inspection of the place in April last, I came to the conclusion that no large port in India so much requires a new and correct chart. This duty will probably occupy the "Clyde" until the middle of January.

3. After completing the survey of Amherst, the "Clyde" should leave for Diamond Island, re-measuring the difference of longitude between Amherst and the Island, thus determining the latter position with regard to the former by the most rigorous method.

4. The survey of Akyab, which was commenced by Lieutenant Jarrad and his assistants last season, was suddenly stopped by an outbreak of cholera on board the "Clyde," which resulted in the death of Sub-lieutenant George, R.N., the senior assistant. The health of the officers and crew was so unsatisfactory as to cause me to order Lieutenant Jarrad to suspend his operations at that port. He had, however, obtained the main triangulation, and I propose that the "Clyde" should, after obtaining observations at Diamond Island, proceed to complete the survey of Akyab Harbour and its approaches.

5. I would suggest that on the way there the "Clyde" should visit and examine the entrance to Sandoway river. The Chief Commissioner of British Burmah has addressed me on the subject, and forwarded a correspondence from Colonel Sladen, the Commissioner of Arakan, urging the desirability of such an examination, and pointing out the great inconvenience caused to the public service on account of the mail-steamer anchoring outside the bar, when it is believed, from local report, that they could anchor inside the river. Without a chart, however, it is but reasonable that the commanders of the mail steamers should object to risk the safety of their vessels. I therefore quite concur with Colonel Sladen that there should be, as soon as possible, a survey made of this locality. This service would occupy about a fortnight.

6. The survey of Akyab will embrace the Oyster Reef and Heckford Patch, and includes a much larger area than that originally contemplated, and it will probably require at least two months to complete. Should time admit, I propose the "Clyde" should then proceed to Kyouk Phyou, and continue the work commenced there last season. A part of the time would be devoted to dredging in each locality.

7. The "Constance" is so ill-adapted for surveying service in every way, that I think it most undesirable to fit her out again. I therefore propose that this vessel be removed from the marine survey, and will address the Government on the subject in a separate letter. The saving effected by this measure will furnish more ample funds than we require for the useful operations mentioned in the next paragraph.

8. My visit of inspection to the Mergui Archipelago clearly shows to me that by the aid of additional soundings and an examination of the dangers contiguous to the navigable channels (which, though well known to the Chinese pilots and native fishermen, are not laid down on the Admiralty Charts), the existing charts would suffice for the immediate requirements of commerce and navigation. With this object in view I made inquiry of the British India Steam Navigation Company what would be the hire of one of their small steamers for two months, from middle of January to the middle of March. They give the approximate cost at 20 rupees per ton, which is too high. I would therefore propose to utilise the "Ava" steamer,* attached to British Burma, when, with one assistant to accompany me, I could undertake to complete all that I consider is at present absolutely necessary in that locality. Ultimately, as trade increases, yet not for many years, a more rigorous examination would of course become necessary. An estimate of
the

* Since reported as unseaworthy.

the cost may be given after I have been able to communicate with the Chief Commissioner of British Burma or the Master Attendant of Rangoon, if the sanction of Government be accorded to my doing so.

9. There would, on the above cruise, be a good opportunity of dredging and for various researches in natural history; and should the Government approve of this part of my programme, I propose that Dr. Armstrong, the naturalist attached to the "Clyde," should accompany me for the purpose of investigating the fauna and flora of these hitherto but little known islands.

10. I have also to ask for the sanction of the Government to my visiting, with a view of ascertaining the immediate wants as regards navigation, all the ports on the Coromandel Coast which are touched at by the British India Steam Navigation Company's vessels from False Point southward as far as Tuticorin, or perhaps up to Beypore. I would then be in the same position to give an opinion on any nautical question relating to either lighting, buoys, or the general navigation of this east coast of India, as I am concerning the west coast from Beypore northwards, and with respect to the Arakan, Pegu, and Tenasserim coasts which were visited by me recently.

11. Should his Excellency approve of the above proposal, I would propose to leave Calcutta in one of the steamers of the British India Steam Navigation Company about September 12, returning from Beypore or Tuticorin to Madras by rail, and thence by British India Steam Navigation Company's steamer to Calcutta, and arriving about 22nd October, after having had second opportunities of seeing all ports between the two latter places. The approximate cost of this trip is given in Appendix I., and this item has been allowed for in my budget estimate for the current year under the head of "Inspection Tours."

12. Again I would venture to call the attention of his Excellency the Governor-General in Council to the urgent necessity for hastening the completion of the steamer mentioned in his Excellency's despatch to the Secretary of State, dated Simla, 24th August 1875. It is impossible, with the present vessel, to execute the surveys either economically, rapidly, or satisfactorily.

A. Dundas Taylor, Commander (late I.N.),
Superintendent of Marine Surveys.

Calcutta, December, 1876.

COPY of the GENERAL REPORT of the Operations
of the MARINE SURVEY of INDIA, from the
Commencement in 1874 to the end of the Official
Year 1875-76, made under the Directions of
Commander *Dundas Taylor*, Calcutta, 1876

(*Lord John Hay.*)

Ordered, by The House of Commons, to be Printed,
21 March 1877.

[*Price 11 d.*]

RETURN to an Address of the Honourable The House of Commons,
dated 26 February 1877;—for,

“COPY of the REPORT to Marquis of *Salisbury* by Miss *Mary Carpenter* on
PRISON DISCIPLINE, and on FEMALE EDUCATION in *India*.”

India Office, }
24 April 1877. }

GEORGE HAMILTON,
Under Secretary of State.

ON PRISON DISCIPLINE IN INDIA.

To the Right Honourable the Marquis of *Salisbury*, Her Majesty's Secretary
of State for India.

My Lord,

HAVING been requested by your Lordship to lay before you in writing the views on prison discipline in India which have been matured during my fourth and last tour, I beg respectfully to offer to you the following.

When I first went to India in September 1866, my object was solely to show friendly sympathy with the native inhabitants of that country, and to co-operate with them, if desired, in the improvement of female education.

On my arrival in Bombay, however, I received an official letter from the Secretary to the Government, dated 26 September 1866, containing an order from his Excellency the Governor in Council (then the Right honourable Sir Bartle Frere) to the Inspector General of Prisons, and gentlemen in charge of various institutions, to afford me every facility for studying them, with a view to my afterwards conferring with the Government on the subject and communicating the results of European inquiry and discussion.

Your Lordship is aware that I had from the very commencement taken an active part in the reformatory movement, that I had devoted careful study to the principles of prison discipline, and had recently published a work on the subject, entitled “Our Convicts;” I felt, therefore, that I could not refuse so cordial an invitation.

After visiting various prisons and other institutions in the Bombay Presidency, I addressed a memorandum to that Government containing my views on prison discipline, reformatories, lunatic asylums, Government schools, and female education. I learnt, however, from the Governor and from the heads of the educational and prison departments, that none of the principles I deemed important could be carried out except under the sanction of the Governor General of India. I therefore decided on proceeding to Calcutta. Having found my views confirmed by my visits to other presidencies, and by conferring with experienced and influential gentlemen in charge of various institutions, I laid the following statements before the Right honourable Sir John Lawrence, the Governor General of India in Council:—

REFORMATORY SCHOOLS AND CERTIFIED INDUSTRIAL SCHOOLS.

Schools of these two kinds have now been established for many years in England, and the success with which they are attended is generally acknowledged.

They are founded on the principle that gaols are not adapted to youthful criminals, who ought rather to receive moral and industrial training.

There appears a very great need of the establishment of similar schools in India; reformatory schools for older and hardened offenders who have been in prison, industrial schools for younger children and juvenile vagrants who are likely to fall into crime.

Many of both these classes may be found in the prisons of India, or are wandering over the country. They are certain to perpetuate a criminal class, unless timely steps are taken to reclaim them. Many of these boys have been several times in prison, and are already desperate characters, contaminating all who come within their sphere.

The reformatory and industrial schools in England are established by private benevolence, and are supported by payments made by the Treasury to the managers, towards the maintenance of each offender, payments from county rates by special agreement, and voluntary contributions. A Consolidated Act for each class of schools was passed last Session.

It is probable that India would require a somewhat different system for local reasons, and that here the initiative must be taken by the Government. At the same time it is probable that if encouragement were given by the Government, by the passing of a law authorising and partly providing for such schools, municipalities may be able to take their share of the needful expenditure and management. A general feeling appears to prevail among both European and native gentlemen who are in any way connected with the criminal classes, as to the importance of such establishments in India. They need not, for many reasons, be nearly as costly in India as in England, and it is probable that the labour of the boys may be made nearly to cover the expense of their maintenance.

I would therefore respectfully but strongly urge on the Legislature the importance of taking steps as soon as possible to establish such schools.

Will you permit me to forward herewith my "Suggestions on the Management of Reformatories and Certified Industrial Schools," which contain an account of the system generally adopted in England.

CENTRAL GAOLS OR CONVICT PRISONS.

The erection of these for long-sentenced prisoners will be a very important measure, and will not only remove a great difficulty which now exists in the management of the common gaols, but will also afford an opportunity of carrying out the admirable system of convict treatment which proved so successful in Ireland under the management of Sir Walter Crofton. The principles of this system are now being universally accepted by distinguished persons in every part of the world who have studied the subject, as well as by the Royal Commission on Prison Discipline in 1863. For a full statement of those principles, and of their practical application, I beg to refer to the second volume of my work entitled — "Our Convicts."

India appears in many ways to present peculiar facilities for carrying out this system, and the remarkable results of the industrial system developed in Alipore Gaol, prove that it might be done at comparatively little expense. The success with which the license system is carried out in Poona by the acting superintendent proves that, under careful management, prisoners trained under a good system may be easily absorbed into society as self supporting and honest members of it. In the erection of the central gaols, therefore (convict prisons; as they are termed in England), it appears particularly important that regard should be had to adapting them to develop this system. It is especially necessary that there should be *separate sleeping cells for all the prisoners*, except for those who have arrived at the third or intermediate stages, which is the final preparation for discharge.

COMMON GAOLS.

In all the gaols I visited great attention appeared to be paid to the industrial work, which in many cases was admirably carried on; the prisoners were thus being prepared to procure an honest livelihood for themselves on their discharge, and considerable proceeds were realised towards their expenses. A salutary influence appeared to be exercised over the prisoners, who in general were working with diligence and goodwill under proper superintendence.

The good effects which might be anticipated from this system were however greatly diminished by the *want of separate cells*. It is evident that when for 12 hours out of 24, men are locked up in cells without light, sometimes three or four together, sometimes even from 40 to 50, nothing but the worst results can be expected. It is quite impossible that even common order or propriety can be preserved. Immoral communication must neutralise any good influence which the prisoners may have received during the day. The greatest contamination must be the result of such an arrangement, and at the same time the deterrent effect of punishment is much lost, as solitude is greatly dreaded by this class of prisoners. Not only are the moral effects of the existing system very injurious, but also the physical. The various prison reports frequently speak of a dreadful mortality decimating the gaols, or even carrying off one-fourth of the whole number of prisoners. This must be chiefly due to the sleeping arrangements, which bring persons of poor or even of bad constitutions into injurious proximity with each other. Overcrowding the gaols appears to be the usual cause of any great mortality, as in other respects sanitary arrangements are carefully attended to in other gaols I visited.

The construction of separate sleeping cells in all the gaols would of course involve considerable expense, but this would be in most cases greatly lessened by employing the labour of the prisoners. In many of the gaols which I visited a sufficient number of cells could be erected without any other cost but that of material. Still, whatever may be the outlay

outlay needed, it is evident that it should not be any impediment in the way of doing what is so important both for the moral and the physical welfare of the prisoners.

The want of any arrangements for securing instruction to the prisoners is also a great evil. It is now an acknowledged principle in the treatment of prisoners that every means practicable should be afforded them of leaving the gaol better members of society than when they entered it; instruction is evidently a most important means of securing this, especially in the case of these prisoners. We cannot give them religious instruction, but we can give them that teaching and that moral influence which may enable them both to know and to do their duty. In no gaols that I visited was there any place provided for instruction, nor was there any schoolmaster on the staff. The gaol regulations did not make any provisions for these, or for any time when instruction could be given to the prisoners. The teaching given in Alipore Gaol cannot be regarded as an exception, because this is not universal, and is chiefly with a view to enable the prisoners to do such work as requires a knowledge of reading and writing.

I would beg respectfully to suggest that regular instruction should be made an essential part of the prison discipline of every gaol. To effect this the hours of labour need not be shortened, as three hours could advantageously be deducted from those spent in sleep; a proper school-room and apparatus would be required to be provided for, and especially a suitable number of teachers.

The removal of the long-sentenced prisoners from the common gaols, which is, I am informed, under contemplation, will doubtless facilitate the adoption of both of these changes, and in many ways be a considerable advantage.

FEMALE PRISONERS.

In all the gaols which I have visited, except in Calcutta, the females prisoners occupied a portion of the ordinary gaol. This was usually the worst portion of the place, and there was no provision for separation either by night or by day. They were under the care of male warders. The work provided for them was of a nature not to improve them, and no instruction was given them. No lady visitors ever go near them; indeed I was informed in one case that the habits of the prisoners are so filthy that it would be impossible for ladies to approach them and sit down among them.

It may easily be imagined what is the result of this. Not only is it impossible for any improvement to take place, but the women become deteriorated. In one gaol I was informed that the good dietary and the freedom from strict discipline so completely removed all dread of imprisonment that the women repeatedly returned after discharge.

It is evident that this is an enormous evil.

I would beg respectfully to urge,

First.—That all the female prisoners should be in separate cells, unless working under suitable supervision.

Secondly.—That female warders *only* should have charge of the prisoners. It is probable that the chief of these at least must be a European, to secure proper discipline.

Thirdly.—That the work should be of a kind to fit the women to earn their livelihood on their discharge.

Fourthly.—That regular instruction should be provided for them.

Fifthly.—That European ladies should be invited to visit them, as in England, with a view to impart to them a kind and good influence.

Calcutta, January 1867.

On my return to England the subject of prison discipline in India engaged the attention of the Social Science Association, whose council sent an important deputation on the subject to the Secretary for India, the Right Hon. Sir Stafford Northcote, laying before him the points mentioned in the foregoing paper.

My experience had been limited to the South of India, but Major (now Major General) Hutchinson, Inspector General of Police in the Punjab, being then in England, fully confirmed from his own experience the great evils which arose in the Indian gaols from the want of separate sleeping cells, and from other defects of principle.

The subject of the Indian gaols was at various times brought before the public through the Social Science Association, and a deputation from that body which waited on the late lamented Lord Mayo before he started for India, led to the hope that some great improvement would be made. Lord Napier and Ettrick, the Governor of the Madras Presidency, had much lowered the high death rate in this presidency by the attention he had given to improve the gaols. But no progress had been made in introducing the system of separate sleeping cells,

which is the one essential condition of all improvement in gaols. The principle of its importance had not been accepted in India.

The subject of Reformatory schools had been seriously considered by many official gentlemen in India; among them I may mention Lord Napier and Ettrick, Dr. Dallas, Inspector General of Gaols in the Punjab, Dr. Brake, Inspector General of Gaols in the Central Provinces. These gentlemen earnestly desired to establish reformatories for boys on the English system adapted to India, but the want of the necessary legislation prevented efforts from being made, and in the case of Nagpore caused the discontinuance of a very promising reformatory institution which was commenced soon after my visit there in 1870.

On the last subject, progress had been already made by the Government of India before I started on my fourth tour. The draft of a Bill had been already prepared and circulated for consideration by experienced persons. It was admirably adapted to carry out the object, and embodied the general principles of our Reformatory and Certified Industrial Schools Act of 1866. This has since become Act V. of 1876.

My object in this visit to India was particularly to study the kind of cells which bore the tests of experience as adapted to the wants of that country, to ascertain the proximate cost of erection of these, to gather the opinions of official gentlemen on the practicability and value of the system, also to converse with them on the possibility of giving some intellectual and moral instruction to the prisoners. I desired also to see the condition of the female prisoners, which was extremely unsatisfactory on my first visit, when they were under the care of male warders, in complete association day and night, and without any instruction or skilled industry.

Though it would be premature to attempt to promote the establishment of reformatories, yet I was desirous of taking any opportunities that might occur of diffusing a knowledge of the principles which the English experience of 20 years has proved to be sound.

My tour on the present occasion extended from Hyderabad and Kurrachee in Sind, to Dacca in East Bengal. I visited Bombay, Ahmedabad, Surat and Baroda, and Tanna, Poona, Madras and Calcutta, and Serampore. I was unable to go on to the Punjab, but visited Allahabad and Benares, and wherever I went I made it a special object to visit the prison in company of the superintendent. Everywhere I received kind attention and the expression of full sympathy with my views.

It would be unnecessary for me to trouble your Lordship with a detailed account of each visit; I will confine myself to the results of my observations, referring only to individual cases as illustrations.

I. *Reformatories.*—I regretted to find that the real nature of these institutions was little understood in India. A portion of a gaol separated from the part occupied by adults and appropriated to boys, who received some schooling was named a reformatory! Such I saw at Poona! In the Presidency Gaol, Calcutta, 50 young boys were thus associated together; of these many were mere children, who had been several times in gaol, and were graduating to become qualified for the juvenile criminal department of the gaol; in this I saw 150 young men, who, in their turn, were aspiring to enter the adult department. All the official gentlemen whom I saw there deeply deplored this state of things, which it was simply impossible for them to alter in gaols constructed as at present. Thus a criminal class is being created and considerably increased in India. In the Madras Gaol great improvements had been made since my first visit, and the juvenile department was as good as it could be under the circumstances, but not of course a fit place to train up young boys to get their living in society. I saw there a boy of 10 years of age, *in irons* and a *life convict*. This poor lad had unfortunately been among a number of sailors guilty of mutiny and murder.

The certain contamination attending the sending young boys to gaols prevents magistrates in many parts from sentencing them, consequently very few are generally to be found in prisons, though it is well known that there are numbers who would be greatly benefited by training in reformatories on the English system. These might be carried on in India at far less cost than in our country. No large expensive buildings would be required; in fact, they would be very
undesirable,

undesirable, as the boys should be accustomed to live as much as possible like their countrymen. The clothing would be merely a cotton garment in most parts of the country, and the boys would very soon be able to raise from the land as much as would suffice for their own maintenance. Though some time will probably elapse before these institutions are general, yet I hope that a few which may serve as models will ere long be established. The Lieutenant Governor of Bengal, Sir Richard Temple, expressed his intention to establish a true reformatory on a piece of land near Calcutta as soon as arrangements could be made. At Madras, Mr. Sabhapathi Iyah had communicated to his Excellency the Governor his willingness to present a piece of land 40 acres in extent for the purpose of a reformatory, and a native chief offered to build a house on it. Native gentlemen in many parts expressed a willingness to co-operate. In Bombay the Sassoon Reformatory for boys has been in existence for more than 20 years, and it is believed to have done much good. I am not aware whether the managing committee propose bringing it under the operations of the Act. With increased powers and the knowledge which can be acquired only by experience, it may be made a valuable institution.

II. *Female Prisoners.*—Very great improvement had taken place in the arrangements for these since my first visit. In 1870 I visited Nagpore Gaol, where the women were receiving daily instruction from a native female teacher, who had been trained in the Madras Girls' Mission School. They were also taught skilled needlework and beautiful crotchet. On my present visit I found everywhere, except in the Serampore Gaol, a regular female warder in charge of the women. These were generally East Indians, in some cases the wife of the gaoler, or a native woman who had happened to have special training. Skilled work was generally given to the prisoners, though rarely instruction. Occasionally there was regular discipline carried out, as in the Allahabad Central Gaol, where the female department was quite separated from the male prison, and under the care of an experienced female official. In the female department of Benares Gaol there were well-arranged *separate sleeping cells* for the female prisoners, in which they could without any hardship remain by day, if their conduct rendered such separation desirable. The matron found this of immense advantage in enabling her to exercise an influence over the prisoners; they had daily an hour of regular instruction. This was, however, the only instance of the kind I saw, and it proved how much might be done to ameliorate the condition even of these unhappy women if there were premises constructed on sound principles and officials suited to their work. I regret, however, to say that in many cases the sleeping wards of the female prisoners were most unsuitable, and the women in charge unequal to their work.

III. *The General Question of Separate Sleeping Cells.*—Separate sleeping cells are absolutely essential to any true prison discipline. I need not attempt to prove this, for your Lordship is aware that not only has the principle of separation at night been long adopted in our own country, but that it is universally accepted as necessary on the Continent and in the United States. It was, however, at one time supposed that the circumstances of the different climate of India, and the nature of the inhabitants, rendered separation at night undesirable, if not impossible. Such objections appear to have entirely died away; for on my present visit I never heard any but the same opinion from all the official gentlemen with whom I conversed, that the present system of association in sleeping barracks, where often 60 prisoners are locked up together for 12 hours every night under the supervision only of convict warders, gives rise to frightful crimes, creates and continually increases a criminal class, is physically very injurious, and greatly diminishes the deterrent influence of imprisonment. Hence crime, and consequently expenditure, is much increased by this system, and great injury is done to offenders who are deprived of liberty by the State, and to the society from which they come, and to which they must return.

Granting, then, that separate sleeping cells ought to be universal in India, and that the expense attendant on commencing the system is the only obstacle to their introduction, it is to be considered what kind of cells are best adapted to India, and the necessary expense of these. The English cells are altogether unsuitable. In India we must provide for ventilation and for protection from

heat. The prisoners also are not in general violent and audacious, and do not therefore require for their control the same strength of cell as in England. I have heard it stated by a highly competent authority that it is easier to govern 1,000 Hindu prisoners than 10 English convicts. I have been told by official gentlemen in different parts of the country, that in ordinary gaols there are not more than five per cent. really bad men. This seems at first a startling assertion, but it must be remembered that many offences which are necessarily punished severely for the safety of society do not involve moral delinquency in the individual, who may be in other respects an inoffensive man. The Hindu is usually amenable to discipline when treated judiciously, and is not generally violent. At the same time he is very susceptible physically and mentally, and could not endure the absolute solitude of our gaols. Many kinds of cells which I saw would be very injurious to them. In one gaol were punishment cells of a very costly structure, large and dark, and supplied with fresh air by an expensive and complicated machine; in another they had been newly constructed with expensive masonry, but high, with so strong a draft from a top window, that it was difficult to protect the prisoners from bronchitis and pulmonary disease. In another gaol there was a dark inner and outer cell with a separate verandah, a costly but very gloomy place, so constructed that the warder could not see the prisoner without actually going to the inner cell. It is necessary then to ascertain what kind of cell combines the various requirements for fitness with a moderate cost. Poona City Gaol is probably the only one in the empire where these conditions have been satisfactorily fulfilled for so long a time, above 12 years, as to test their fitness. The gaol contains 400 male prisoners, each of whom has a separate sleeping cell. The cells are arranged in blocks of from 25 to 30, radiating from a centre, with a small court between each, the front of one block facing the back of the next. The cells are about 7 x 10 by 12. Each has a window near the top of the back wall, while the door consists of strong iron bars, thus admitting air and light. There is a verandah running along the block, so that a warder walking along can see what every prisoner is doing. The prisoners can be kept in their cells working all day without injury. Such cells need not cost more than 10% each if with gaol labour. The superintendent of Hyderabad, Sind, showed me a cell adapted to the peculiar conditions of their country, which he could build at the cost of only 2%. There, as everywhere in India, was abundance of space, so that the gaol could be provided with separate sleeping cells at a very small expense. It is evident that so moderate an expense would soon be covered to the Government by the great diminution of the number of prisoners, which would very soon take place wherever the system is carried out.

Expense would also be saved in other ways. With the prisoners sleeping in association in large barracks, a military night guard round the prison is required for security. In the Ahmedabad Gaol, for instance, with 450 prisoners, there is a staff of 35 paid officials, and also a military guard of 42 persons. For this last the Government is paid 10,000 rupees, or 1,000 £. per annum. Now this gaol is an old Mahomedan college, remarkably massive and secure; though in many respects very ill adapted for a gaol. The military guard and probably many of the paid officials might be dispensed with if a proper system were introduced. A well-built gaol, where each prisoner is securely locked at night in a separate cell, would not require a large expensive military guard at night, which does not prevent prisoners from escaping at times.

I believe that many of the gaols I saw could be altered at a very moderate expense, so as to provide separate sleeping cells for all the prisoners, if the principle were adopted by the Indian Government. I would instance the gaols at Ahmedabad, Surat and Tanna, which I visited and examined carefully. The central gaol of Yerrowda, near Poona, has been built since my first visit on a very large piece of land. The estimate which had been given for it was, I was informed, nine lacs of rupees; it was not finished when I saw it, and 11 lacs had been already spent. The premises covered 60 acres of land, with a circumference of a mile and a quarter. A thick and high wall surrounded the whole, and a second wall was being built round in addition, to prevent escapes. There appeared to be a great amount of unnecessary and expensive masonry in many parts. This gaol was calculated for 1,500 prisoners, with only 80 separate

cells,

cells, or between five and six per cent. When therefore a batch of 70 prisoners was brought to the gaol they were obliged, if the cells were occupied, to be at once thrown into sleeping association with the others, carrying with them fresh details of crime. How unnecessary the expense of that second wall would have been if there had been separate sleeping cells is proved by the fact that, while several hundreds of prisoners are daily working outside the walls, only three prisoners escaped during the year, one of whom was returned. This gaol could even now be altered at a moderate expense, some of the sleeping barracks being converted into workshops, and others furnished with walled partitions about eight feet high, so as to produce physical separation. There was abundant space for new blocks of cells.

The Benares Central Gaol is now being built. If prison labour were employed the superintendent has calculated that thoroughly strong and well-made cells might be made at less than 20 l. per cell, so as for every prisoner to have a separate cell. This has not been allowed.

It appears then that the direct expense of separate sleeping cells is by no means as great as was apprehended, and that the indirect expenditure connected with the gaols would be diminished by the adoption of the system.

The cost of crime would necessarily be diminished by a system which is deterrent, and which might render prison discipline reformatory.

IV. With respect to instruction given to the prisoners, no alterations appeared to have been made since my first visit. No paid teachers are provided by the Government. In some gaols educated convicts give instruction to those who desire it. I found it a general opinion that it would be useless, and indeed impossible, to give instruction in reading and writing to the bulk of the prisoners. At the same time it was much to be regretted that no attempt should be made to impart some moral instruction to these men, which might enable them to leave the gaol somewhat better than they entered it. At Hyderabad, Sind, during the last seven years, some native gentlemen have been accustomed to give addresses to the prisoners every Sunday morning with good effect. I was present when 700 prisoners, Mahomedans and Hindus, ranged sitting in the court-yard, received such an address with apparent interest. A similar plan has been adopted at Rutnagiri with success. I have learnt at Ahmedabad some native gentlemen have obtained leave to address the prisoners in a similar manner. It appears then that there would be no practical difficulty in engaging the services of respectable native schoolmasters who might teach the prisoners daily for two hours, deducted from the 12 hours of sleep, and give oral instruction to those who could not learn to read.

It would be unnecessary for me to trouble your Lordship with remarks on the other points of gaol discipline, these two being in my opinion the most important ones, involving fundamental principles which have long been accepted in our country. I would beg only to say that there appeared to me great anxiety among officials everywhere to carry out well the appointed regulations, and that the system of skilled labour developed in the Indian gaols seemed to me of very remarkable excellence. The skilled labour taught to the prisoners at little more than the ordinary expense of supervision contributed very largely to the support of the establishment, has a civilising effect on the prisoners themselves, and prepares them for future life. This excellent development of industry was not however universal. There was not any uniform system of gratuities to the prisoners for work, or remission of sentence as a reward for good conduct. In some parts of India there was a system of convict warders, which was found to work admirably, while in other parts this was not adopted. Hence there was no general system adopted in the Empire.

Having the honour of an interview with his Excellency, the Viceroy, Lord Northbrook, I suggested to him the importance of having, as in Great Britain, certain general principles laid down for the whole Indian Empire, while details are left to local governments. By the desire of his Lordship I had subsequently an interview with the secretary to Government, Mr. Arthur Howell, who entered fully into my views on this subject. At his request I sketched out

what appeared the most important principles. I beg to submit to your Lordship a copy of this document :—

To *Arthur Howell*, Esq., Secretary to the Indian Government, &c. &c.

Sir,

Allahabad, 29 January 1876.

In accordance with your request that I should lay before you the principles adopted by the British Government in all prison discipline, which, I think, should also be universal in Indian gaols, I beg to state the following :—

I. That all prisoners should sleep in separation during the whole term of their imprisonment.

II. That education should be given daily by competent native teachers, with moral instruction.

III. That a first stage in all imprisonment should be passed in separation from other prisoners day and night, with unskilled labour, penal dietary and instruction.

IV. That there should be a system of marks for conduct, labour, and education, with gratuities for extra work, enabling the prisoner by his own exertion to rise to greater privileges, and to obtain remission of sentence.

In adapting these principles to the conditions of climate and character in India, I would offer the following suggestions :—

I. The climate requires a thorough ventilation and protection from heat, and the cells must evidently be constructed on a perfectly different system from those in English prisons. The prisoners, often of weak constitution, their minds unrelieved by thoughts of anything good, and unable to derive ideas from reading, ought not to be subjected to the unbroken solitude of English prisons, which would be injurious as well as useless. The cells in the Poona City Gaol fulfil these conditions. They are built with doors of iron bars and a window near the top of the opposite wall. The dimensions are about 7 + 10 by 12 feet high, or rather less. They are in blocks of cells, radiating from a central office, of from 25 to 30 not facing each other, and each block with a running verandah. The warder walking through this can see each prisoner well, while communication between prisoners would be easily stopped. These cells can be used by day for work. Some more penal cells may be resorted to in case of infringement of rules. A curtain can be hung up at night before the door in cold weather. These cells have been used for more than 10 years with the greatest advantage, both morally and physically, in this gaol holding 400 prisoners. In the district gaols at Benares the women have similar separate cells, which are found by the matron of the greatest advantage. These cells might be built with two stories, thereby probably saving expense, space, and supervision. I have been told that they might be erected at a cost of material (with prison labour) of about 10 L. each. I have seen many cells in various prisons which appeared to me very injurious to the prisoners physically, and oppressively dark. Some of these were constructed at a great unnecessary expense, as the Poona Gaol cells answered perfectly well. The superintendent of Hyderabad Gaol, Sind, showed me a cell which he deemed suitable, which he could erect at a cost of materials of 2 L. only! Existing sleeping barracks might be altered for the advanced class of prisoners, by having a thin wall erected between the beds about eight feet high, leaving a portion of window for each division, and a passage for the warder down the middle. It may not be deemed right with regard to expense to alter all the gaols already built, but if the principle is adopted by the Supreme Government, all future gaols should be built on the separate system for night cells, and many existing gaols may be altered at a comparatively small expense. From want of a good system of building much useless expense is at present incurred. I need not enlarge on the immense importance of these separate sleeping cells. It is, I think, universally conceded that adoption of this will not only diminish the present contaminating effects of imprisonment, but be a deterrent, and eventually save cost by diminishing the number of prisoners.

II. It is particularly important to infuse some good ideas into the minds of prisoners. This should be done by oral moral instruction daily, as few will be in a position to gain by reading. Two hours at least daily should be devoted to instruction in a hall appropriated to the purpose. This should be deducted from the 12 hours now allotted to sleep.

III. It would not be desirable to keep the prisoners more than three months in separation by day. A month might be sufficient, dependent on good conduct. Short sentenced prisoners in district gaols should remain the whole time in separation.

IV. This system of marks and gratuities has been introduced in some gaols. It should be universal.

It

It would be desirable to distinctly separate *central* and *district* gaols, the long and the short time prisoners.

A general system of dietary, of salaries, &c., should be prepared by the Supreme Government, as in England, leaving a certain discretion to localities in this as well as in other details.

This is a sketch of what appears to be most essential. Kindly inform me if you wish any fuller details.

I remain, &c.

(signed) *Mary Carpenter.*

I have recently received from Mr. Howell a printed circular to convene an Indian Prison Congress at Calcutta during the next cold weather. This may prove a very valuable opportunity of arranging some general system of prison discipline for India. At the present time this would be very important, as new gaols are in course of erection. At Benares a large central gaol is being built, and the superintendent has not been allowed to carry out his scheme for separate cells. At Ahmedabad a large central gaol has been decided on, but is not built, and doubtless there are many other cases of the same kind. It is of course to be desired that all new gaols, and all old ones requiring extensive alterations, should be put on a sound principle. The time is therefore most opportune to hold a Prison Congress in Calcutta. Your Lordship is fully aware that the principles of prison discipline which I have here stated have at different periods been discussed in Parliament, and were closely scrutinised by the Prison Commission of 1863. These now are the foundations adopted by the British Government in its penal system. The Prison Congress which assembled in London from all parts of the world in 1872 endorsed the same principles. These are being promulgated in the United States in Congresses held annually for the purpose in different cities. The London Congress appointed a Standing Committee of Delegates from the different states of Europe, in all of which the separation of the prisoners at night throughout their sentence, and the entire separation during at least a part of their confinement, is accepted as an essential, while their ultimate reformation as the surest means of minimising crime, is the object aimed at by all. The Congress will meet at Stockholm next summer, that the members may compare the results of five years of earnest work.

India does indeed greatly differ from England in the climate and in the condition of its inhabitants, but probably not more than other countries of the world differ from each other. But the same general principles of prison discipline are found to be true in all. I trust that the coming Congress at Calcutta will establish their acceptance in India.

Having commenced this report with a statement which I made during my first visit in 1866 to his Excellency the Viceroy, then Sir John Lawrence, your Lordship will perceive that the views then formed have been entirely confirmed by the present one, 10 years later. The importance of at once adopting the system of separate sleeping cells for all the prisoners has forced itself still more strongly on my mind through the observations I made during my last visit, and the testimonies of experienced persons which I heard wherever I went.

Hoping that what I have written will receive your Lordship's kind acceptance,

I beg, &c.

Red Lodge House, Bristol,
7 September 1876.

(signed) *Mary Carpenter.*

ON FEMALE EDUCATION IN INDIA.

To the Right Honourable the Marquis of *Salisbury*, Her Majesty's Secretary of State for India.

My Lord,

IN compliance with the expressed wish of your Lordship, I beg respectfully to lay before you the following statement respecting the education of the female sex, with the consequent emancipation and elevation of woman in her social position. To promote this was my chief object in visiting India.

In order to explain my objects and observations in my last and fourth journey in 1875-76 it is necessary for me to refer to my first, in 1866-67. This will be most concisely done by laying before you the report and recommendations then presented to the Governor in Council, Sir John Lawrence. It is as follows :—

The present condition of female education in India can be improved solely by the introduction of female teachers, and these can be supplied only by the establishment of Female Normal Training Schools.

The Government of India has long adopted this course to supply male teachers to boys' schools. The boys' schools are provided with good and efficient teachers, and are producing excellent results. If the same course is pursued for the girls' schools, there can be no doubt that similar results will follow after the system has had time to work. Isolated efforts have been made in some parts of Bengal to supply teachers by the establishment of Normal Schools; but these only prove the necessity of a more complete system.

Feeling assured that the Government has hitherto held back from taking this course, not through any apathy respecting female education, but from a desire to be assured that the want is actually felt by enlightened Natives, before taking any initiatory steps in the matter, I have in the Madras and Bombay Presidencies, ascertained that enlightened Native gentlemen are most anxious for the establishment of such schools, as they have testified to me in writing; in Ahmedabad and Madras steps have been already taken by them in memorialising their respective Governments. In Calcutta I have ascertained that many respectable persons are desirous of the establishment of such schools, and have memorialised Government on the subject; the want of them is very strongly felt also in many important places in the mofussil.

I am well aware that the difficulties to be encountered in establishing training schools for female teachers are much greater than those attending male normal training schools. The ignorance of Hindu women of a suitable age is one great impediment, and the difficulty of finding any such, except widows, who would be able and willing to be trained for teachers, is another. I have fully considered these and many other obstacles, and having done this, and consulted persons of considerable experience in different parts of the country, I am persuaded that they may be surmounted.

The following are suggestions which I would beg to offer as to the general features of such a school as I desire to see established. It will, of course, be clearly understood that in these proposed institutions the Government principle of non-interference in religious matters is to be strictly adhered to. While the personal religious liberty of every inmate of the institution is to be respected, no one while in it is to attempt any religious proselytism. Different localities will have different requirements and adaptation to special circumstances. It will therefore be better in every case to commence on a small scale, and with as much attention to economy as is consistent with the proper development of the institution.

Suggestions for the Establishment of a Female Normal Training School.

First.—A house should be procured, adapted to furnish a comfortable residence for about a dozen Christian students, with a lady superintendent. Arrangements should be made for the separate boarding of non-Christian Native students when required. Arrangements for necessary furniture, board and attendance to be made by the inspector of schools.

Secondly.—A lady superintendent, who should be responsible to Government for the entire management of the institution, should be obtained from England (at a salary probably of about 200 rupees a month, in addition to board and lodging); and a superior mistress for training (at about 150 rupees a month, in addition to board and lodging). In each case the passage money to be paid under certain conditions.

Thirdly.—Persons who wish to become students in training must reply to the inspector, and must satisfy him that it is their intention to study and faithfully to prepare to be teachers. They will receive board and instruction while in the institution. All English students must learn the vernacular, and all Native students English.

Fourthly.—

Fourthly.—Any girls' schools existing in the neighbourhood may be employed for the training of teachers, and the students may thus be exercising a beneficial influence in the schools now taught by men, before they are prepared to take charge of schools themselves.

I have not here entered into details, wishing not to trouble you with more than the general plan. I have, however, carefully considered everything, and shall be most happy to enter into further particulars should any be desired.

I beg to add to this a more detailed scheme, which I subsequently laid before the Right Hon. Sir Stafford Northcote, then Her Majesty's Secretary of State for India:—

To the Right Honourable Sir *Stafford Northcote*, Bart., M.P., Secretary of State for India.

Sir,

Bristol, 8 October 1867.

In the letter which I had the honour of addressing while in India to his Excellency the Governor General on female education, I laid before him the actual position of the question, and gave a general outline of a scheme for the establishment of a female normal school.

I have since closely directed my attention to the subject, in order thoroughly to understand the wishes and wants of the enlightened Natives who desire such an institution, the position it would occupy in the country, the possibility of affording to the English, or other students engaged in it, such domestic comfort and protection as would be essential to them in a foreign country, the habits and manners of which widely differ from our own, and the probability of obtaining an adequate supply of students eventually to supply the general demand for female teachers.

In the consideration of these topics, I availed myself while in India of opportunities of visiting various institutions, of learning the domestic habits of Europeans in that country, and of obtaining what appeared to me reliable information from enlightened Natives in each Presidency, as well as from English gentlemen and ladies well acquainted with the country.

Since my return to England, I have had various opportunities of learning the views of experienced ladies respecting the probability of finding educated persons in this country suited for the purpose, and of discussing with them the position which will be best for them, in view of their going to India to train as teachers.

In all I have availed myself of the experience I have previously gained, both in the management of an institution myself, and in the study of other boarding institutions; I now, therefore, feel prepared to enter into the details of a female normal school, which I respectfully beg to lay before you. The plan is based on the following positions:—

1st.—Female education is now generally accepted by the enlightened part of the Native community as very desirable, and girls' schools are already established in various parts of the country, frequently by Native gentlemen themselves.

2nd.—There are no female teachers for these schools, and they are at present taught by male teachers.

3rd.—Both Native gentlemen and ladies are dissatisfied with this state of things, but cannot remedy it, female teachers not being procurable.

4th.—It would be of course preferred by them to obtain a regular supply of Native female teachers, and this should be the ultimate object to be aimed at.

5th.—But both the educational and the social condition of Hindu ladies present difficulties which at present preclude the possibility of their becoming teachers without long training, and until many existing prejudices are overcome.

6th.—This training can be given only by European or other Christian teachers who have themselves been trained, and the Natives request the help of these, if given on the Government principle of non-interference with religion.

7th.—Such trained teachers are very rarely to be met with in India, and it is necessary to bring them in from the commencement from England.

8th.—These teachers will all require special training for their future work, by the acquisition of the vernacular, and the study of the wants and habits of the children in the Native schools.

9th.—The position of a teacher is not at present deemed in general honourable, or one to be desired by Native ladies; it will, therefore, be very important to the success of the work that the teachers and students should be carefully selected, that their position in the normal school should be good, and that a guarantee should be given by Government for suitable salaries to accredited female teachers in Native schools.

10th. Special provision should be made for the instruction of Native students, besides that, training in the art of teaching which they may receive in common with

the English students, so as to supply the want of previous education equal to that received in our country by pupil teachers.

Accepting these positions as the basis of the normal school contemplated, it is obvious that the special object of the institution at its commencement will be the preparation of the future teachers of Native schools; it will be desirable, therefore, to obtain, if possible, a number of educated persons who have already mastered the ordinary branches of education, but who require to learn the art of teaching, and to acquire the vernacular. Young Native ladies who may eventually become teachers, must first obtain the preparatory education either in the schools now existing, or by special classes formed for them. They should also be learning English, while the English students are studying the vernacular.

The institution should be arranged as follows:

The house provided must contain not only suitable class rooms, but comfortable accommodation for the lady superintendent, training mistress, and students (any non-Christian native students who may require to board in the institution must have separate arrangements made for them), servants, conveyance, and whatever else is needed for a respectable household, to be provided also.

The lady superintendent will have the general management of the institution, provide the board, and in every way be the head of the household. She will make all arrangements necessary for developing the objects of the institution; confer with the managers of schools desirous of obtaining the assistance of the mistress and students; conduct all correspondence, and in all respects be responsible for the due carrying out of the intentions of the Government, to which only she will be responsible.

The training mistress, who is to be an English certificated teacher, will have the entire responsibility of training the students; she will spend a portion of each day with them in the schools; give them such separate instruction as may be needed; and with them receive daily lessons of a master in the vernacular, to the acquisition of which she shall give careful attention. While teaching in any school she shall in no respect interfere with the regulations or wishes of the managers.

Persons desirous of entering the normal school as students must satisfy the lady superintendent that their character and general qualifications are such as to render them suitable for teachers, and also undergo an examination fixed by the Government. They must conform in all respects to the regulations while in the institution, and must receive a certificate of qualification from the lady superintendent, signed by the inspector, before leaving the school to take an engagement as a teacher.

Though the preparation of Hindu women as teachers should be always kept in view, and should be our ultimate object, yet to solve the problem of providing female teachers for girls' schools, it appeared necessary to avail ourselves of the help of Europeans and Eurasians; and this for the following among other reasons:

I. The difficulty of finding any number of Hindu women who would be willing to be trained as teachers. None, in fact, appeared to be available, except widows, as all Hindu girls are married very young. With respect to the widows, great difficulties existed, so that we could not hope for some time to find many.

II. The introduction of them into girls' schools to learn the art of teaching, and to acquire it by practising, would, in the existing state of schools, involve their coming into contact with the other sex, which would be against their social custom.

III. The mental condition of adult widows who might be willing to be trained would be generally such as to render it impossible that a few years' tuition should fit them to be teachers.

It appeared, therefore, that it would be preferable at first to train as teachers educated European and Eurasian young ladies to be teachers, by giving such as might present themselves a good training from English certificated teachers. No such training or normal school had been established by the Government, nor did I hear of any but one school where the attempt was even made to afford it. Many large schools for English girls exist in the country, and there are known to be already existing in the country many respectable young women in narrow circumstances who might be thankful to be prepared to get a maintenance as teacher. Many Eurasians might thus be made useful members of society. Native Christian young women who had been trained in mission schools might have been very valuable, but I learnt everywhere that to introduce

duce that element would ruin the whole scheme, so great is the prejudice in general against them, and the dread of a covert attempt to proselytise.

I soon found, however, that though I had not at all exaggerated the anxiety of Native gentlemen and ladies to obtain female teachers, yet that the existence of numerous and strong prejudices of various kinds rendered it necessary to confine our efforts at present to the giving such training as was possible to Native Hindu women only, and in such manner as appeared most feasible in each locality.

In the spring of 1868 the Indian Government made a grant to each Presidency capital for the establishment of a female normal school. I visited Bombay in the autumn, and commenced work there on the system which I had recommended. A trained English mistress attended on alternate days in two Native schools, and through the medium of an Anglo-vernacular master trained Native teachers in the English system.

My dangerous illness at the commencement of 1869 compelled my return home, and my plans for a female normal school were dropped. The Government subsequently opened a school for the education of Native ladies with a view to their becoming teachers. My plans were not carried out there.

In the autumn of 1869 I again visited Bombay. I learnt that a female normal school had been opened at Nagpore, and at the beginning of 1870 I went to that city to observe its condition. I found that a number of Native women were receiving instruction, with the object of their becoming teachers; an English mistress attended at certain hours. There was no practising school connected with this adult school, and it did not appear to me possible that these women would ever have the power of controlling a class or of really teaching. That Native women have the capability of becoming good teachers if properly trained, was proved by the excellent condition of a mission girls' school in the same city, where I saw two young Native women conducting the classes admirably, with only general superintendence from the wife of the missionary; these had been brought up from childhood in a mission school.

I also visited Ahmedabad, and found that a lady superintendent who had had some training as a teacher, and felt an interest in the work, was superintending the largest girls' school there, the masters working with her; about 10 Native women were being trained as teachers in the school itself, and receiving separate instruction, like pupil teachers. This system answered well, and gave satisfaction to the mothers, who allowed their daughters to remain longer at school on account of the presence of female teachers and a lady superintendent.

During the next five years after my return to England I kept up correspondence with English and Native gentlemen wherever this appeared to me likely to be useful; I also gave such aid as appeared to me desirable, from a small fund at my disposal, always keeping especially in view the training of teachers. During this period the following progress had been made:

At Ahmedabad the Government had established a female normal school, and a Native gentleman had erected premises for it, including a residence for the lady superintendent and a boarding-house for students.

The Bombay normal school had been discontinued after the death of the mistress, and one established at Poona under an experienced mistress, but of the progress of this I had heard nothing.

At Calcutta the girls' normal school had been given up, but a small girls' boarding-school had been established by private effort.

At Madras Government had established a normal school, which had proved successful, but the Native students having become very few, the late Governor, Lord Hobart, had permitted the introduction of Eurasian and Native Christian students, and this had worked well, though at first much opposed by Native gentlemen.

The Nagpore normal school had been discontinued on account of serious evils, and a normal school had been commenced at Jubblepore.

At Hyderabad (Sind), a lady had been appointed superintendent of several small day schools. The success of this had led the Government to establish a normal school, of which she should be superintendent. This had answered well.

In all these Government schools, students received monthly stipends of from 5 to 10 rupees, to compensate for the occupation of their time. Without such payments few students would probably be obtained.

My object in this my fourth visit to India was to study the various attempts to introduce the training of female teachers, and to gather from my observations the causes both of success and failure. Also to form some idea of the actual progress of the movement for female education, and its influence on the elevation of women. In all my work I have adhered strictly to the Government principle of non-interference with religion.

Desiring to lay my views before your Lordship in as brief a form as possible, and yet finding it necessary to enter into some detail in order to show their bearing, it appears to me best to give some account of the position of the work in each place I visited. I shall then conclude with general results, and a statement of what I deem requisite for the progress of the work.

I may first say that on my present visit, the idea of the necessity of female education appeared to me to have permeated Native society far more than it did nine years before, on occasion of my first visit. Whether or not the schools themselves were as much improved as might have been hoped, the effects of the impetus which had been given were discernible in the progress of female emancipation, and in the opening to women of fields of skilled labour; also my journey left on my mind a far higher idea of the possibility of improving the Native woman, and of her general capabilities, than I had previously formed.

At Hyderabad (Sind), female education is of very recent date, and is indeed entirely chiefly due to the zealous efforts of the late Sub-inspector, Mr. Narayen Juggunath. It was commenced by collecting a few girls round a Native woman, who had some slight education. The numbers have gradually but steadily increased, and the want is now very evident of better premises and superior teachers. The normal school has been in existence for three years, and the progress made by the students, under the circumstances, is highly encouraging. No arrangement had been made for a good practising school to be taught by the students in training, without which it is impossible for these women to become teachers. It was proposed to add this.

At Kurrachi there was a good girls' school, under male teachers. A pupil read an address to me in English. I visited the Hindu school, which was in the heart of the Native city, in a small room, into which were crowded for the occasion about 70 girls, with a Native woman as teacher. Very little instruction appeared to be given. The fact of their coming out at all was itself encouraging, as the Sindis are very backward in female emancipation, having until lately been under the influence of the Mahommedans. I had placed in the hands of the inspector 50 £. towards erecting a school building, and a subscription for the purpose was promised by the leading inhabitants. I have not heard of the accomplishment of this. I saw no Sindi ladies except the wives of two Brahmo brothers at Hyderabad. I was invited to meet about 30 Mahrathi ladies resident at Kurrachi. A missionary lady was the interpreter, who had been in the habit of visiting their families. The result of friendly intercourse with an English lady was very favourably evident in their deportment. A Native lady read in vernacular an admirable address to me, stating the ancient superior condition of Hindu women, their own inability to rise without help, and their desire that the English should raise them. They expressed their surprise that a lady (H.R.H. the Princess Louise of Hesse) should be President of an Association, and another lady (myself) secretary. I promised them that should I meet a Native lady of rank who took an interest in our object, I would ask her to be Vice President. The Begum of Bhopal has since accepted that office. This was a remarkable and very interesting meeting.

In Poona my great object was to study the normal school, which had been carried on for some years by Mrs. Mitchell, a lady of long experience among the Natives, and who had previously conducted the Alexandra Girls' School at Bombay for many years. This school has developed the objects intended very successfully, as far as circumstances have permitted. The building is very conveniently situated in the middle of the Native town, and not overlooking the street, so that privacy can be secured. It is not, however, sufficiently large or airy, but Mrs. M. deems it best to sacrifice this for the sake of being of easy access to the students, and to the children of the practising school. On entering, I was surprised at being warmly greeted in English by one of the young women. I asked her if she knew me. "Do I not know my benefactor?" she exclaimed.

exclaimed. "Nine years ago you came with Sir A. Grant to visit a little school which I was teaching. You encouraged me. I was so vexed at not being able to understand you that I determined that I would learn English." I learnt that she had attended the normal school at Bombay, and then came here; that she had married, but the conduct of her husband had obliged her to live separate; that she was now receiving a salary as teacher in the normal school; that her two sisters had followed her example but had declined marriage; that one was a teacher in the employ of a Native chief, and that the other was a teacher here. During my visit an English lady, governess of the Ranee of Kolapur, came to the school to obtain a Native female teacher for the girls' school at Kolapur. Beechebai, my young friend, was selected, and an arrangement was made that she shall not thus lose her position as a Government servant by teaching in a Native State. She is most anxious to go to England, and is saving every rupee she can to enable her to do so, when she is entitled to a sufficiently long furlough. I have troubled your Lordship with these details because they illustrate the gradual progress which is being steadily made. Mrs. Mitchell had assembled as many as were acceptable of the students who had already become teachers, with the children under their care—some 200. This was a gratifying spectacle, and a striking contrast to the state of female education nine years ago, when Beechebai's little school in a small room, painted over with idols, was the grain of mustard seed from which this promising work had sprung. There were about 20 students, all Native women. I heard lessons given to them, and to the practising school by their Native teachers in a superior style. An English lady was employed as an assistant, but there were no teachers in the school acquainted with the English system. At Poona I not only became acquainted with the ladies of some Native families, and received a visit from a widow lady, who has long taken active interest in female education, but, on the eve of my departure from the city, I met a large party of Native ladies, who desired thus to indicate to me their sympathy with my object. About 60 were assembled in one of the ancient palaces of that remarkable city, under the presidency of a Sirdar lady of much influence, and who expressed warm interest in my work. Mrs. Mitchell, from the normal school, attended as interpreter, accompanied by the two sisters who were working with her. These young Native ladies were not only able to translate my remarks to the ladies present, but spoke fluently in English. The meeting was a very interesting and encouraging one, and indicated great progress.

In Madras, the position of female education differs from that of other towns which I have visited, as it is chiefly conducted by missionary bodies, especially Native Christians. Many female teachers have been gradually introduced into the schools. The female normal school was originally confined to Native women, but Eurasians and Native Christians are now admitted in certain proportions, as recipients of scholarships. Miss Bain, a lady of high culture and devoted zeal, has successfully carried out the work with the help of a Native male teacher for the vernacular, and Miss Rajagopal, a very superior Native Christian lady. At the recent Government examinations, out of 18 students who presented themselves, 15 passed. The institution is in a very satisfactory state; the only great defect is that being situated in the suburbs only a small class of girls can be induced to attend. The school has been removed since my visit to a more accessible situation. There is no teacher in Madras who understands the English system. Some of the most advanced students are anxious to come to England to study it for a year.

In Madras, I found several Native ladies of position in society who are obtaining for themselves, at the desire of their husbands, an advanced, and even an English, education under an English governess. They are also allowed more liberty.

Dacca, the capital of East Bengal, though somewhat remote, is considerably in advance of other places in female education, through the efforts of many enlightened Native gentlemen. Here I found a small adult school, unique in its character, which is chiefly attended by married ladies, whose husbands desire for them intellectual improvement. Some of them learn English. Two small girls' schools are in the same building, but they suffer from the want of efficient teaching. Some of the ladies of the adult school might be induced to train as teachers if only they could have an efficient mistress. They cannot

unaided obtain one. A good training school here might soon supply the neighbourhood, as there are many Native ladies in Dacca who have made considerable advance.

Calcutta has made little, if any, apparent progress since my first visit in 1866. The schools were, I learnt, in much the same condition as before. They are chiefly missionary schools. The capacious premises of the Bethune School, which was intended to promote the education of the higher classes, and which might well contain 200 scholars, with separate class-rooms for higher education, has only about a third of that number, in age more fitted for an infant school. Every inducement is held out to them to attend; carriages are provided to convey them to and from school, and there is a superior trained mistress. A fee of 2 rupees a month (6 *d.* a week) is esteemed very high by rich gentlemen. It was attempted to carry out the normal school here, but the attempt failed. In the meantime a rapidly increasing number of the Europeanised Natives and of the Brahmos are earnestly desiring superior education for the female members of their families. I received hospitality from three of such families, who received me in English style. Miss Ackroyd's boarding-school, to which I have alluded, has been of great use. In several cases ladies entered the school whose husbands had gone to England. These, on their return, were thankful to find their wives somewhat educated and accustomed to English habits. Miss A.'s marriage and Mrs. Phear's approaching departure from India led to the discontinuance of the school, but it had done a good work, and a permanent institution of the kind has just been started by the Government.

Benares exhibited some very interesting and instructive features. This being considered a sacred city, it would consequently be a very conservative one in the matter of female education. Fortunately however, the Maharaja of Vizianagram commenced the movement soon after my first visit to India. This nobleman is deservedly celebrated for his enlightened benevolence, and spends a large proportion of his income in works of charity. At first the children were paid for attending school, and a large number came; they discontinued attendance when the payments were no longer made. His Highness then engaged an English lady of experience and energy to carry on the schools at his sole expense, which she has done now for some years. On occasion of my visit I found that she had four schools in houses of easy access to the scholars, and in secluded localities, and she had succeeded in gradually obtaining female teachers only for the scholars. These were Eurasians, Native Christians, and Hindu women. These latter were not very efficient, and there was considerable want of trained teaching in the schools, Mrs. Etherington not being able to give more than general superintendence. The simple fact, however, of no males being on the premises was of very great importance. Not only were there about 500 Brahmin children in attendance, but many widows and marriageable girls were obtaining so advanced an education, as to prepare them to gain their living by skilled industry. A remarkable proof of this came before me. The Native doctor of the hospital had a class of about 10 women from the school, chiefly widows, who were undergoing regular training and instruction for the medical profession. I was present at one of his lessons, and was much struck with the readiness and accuracy of their answers. The doctor found them quite equal to the male students in aptitude and intelligence in the preparation of their lessons. They were still in regular attendance at the school. In the same building with one of the schools is what is called a Government female normal school. This consists of a number of Native women who board on the premises, and who are taught by two Native women only. It is evident that in its present condition this can be regarded only as a second-rate adult school, not likely to produce teachers worth the expense of training. Yet, if a trained English teacher were placed in charge of the school, this might be made a peculiarly efficient central institution for the North Western Provinces. Mrs. Etherington has been appointed Government inspectress of girls' schools. Her position would thus enable her to make the normal school work with the others which are directly under her management. A certificated teacher would be thus able to introduce a good system into the Vizianagram schools, while at the same time she was training her own students in the art of teaching. All the teachers now employed in the four Vizianagram schools might thus receive themselves skilled training, and the schools would become model ones for the province, perhaps for all India. I pointed this out to the inspectress, who fully entered into my views. She would

would gladly co-operate with any plan of the kind, and was ready to give the most important help by offering her services to obtain a suitable mistress, and to arrange for her comfortable residence. I laid the subject before the Maharaja, who expressed perfect willingness to sanction such an arrangement, should the Government desire it.

At Allahabad I found that no girls' school existed which was deemed worthy of a visit, even among the missionaries. A few girls were being collected in some localities through the inducement held out of the payment of small coins.

I much regretted that various unavoidable circumstances prevented my staying at Jubblepore, where my presence had been much desired.

Passing through Bombay I proceeded to Ahmedabad. I regretted to find the girls' schools in this city—which had been exceptionally good on my first visit, and the largest of which was carrying out the work of a normal school under a lady superintendent at my third visit—were now in a very inferior condition. A new separate building had been erected for the normal school at some distance from these schools, with which it was quite unconnected. As great a desire for good teaching for girls appeared to exist in the minds of Native gentlemen, but they were quite unable to obtain it. One Native gentleman had so highly educated his little daughter, now nine years old, that she could read English fluently, and was advanced in arithmetic. She had no means, however, of proceeding farther, and he actually sent her to Bombay to board with a friend that she might attend the Roman Catholic Nunnery School for higher education. I cannot give any opinion about the prospects of the normal school, as the lady superintendent had only recently been established there, and though possessed of various qualifications and anxious to do her duty, she was not acquainted with the vernacular, or with the English system of school teaching.

At Surat two large girls' schools were under male teachers exclusively, as they were nine years before. The bulk of the children had made very little progress, evidently from the ignorance of a good system of teaching. At least half of the children were of an age to be in an infant school. These poor children have nothing to call out their minds, and I was informed by a master that they occupy a year in learning the alphabet!

At Baroda and at Tanna female education had been only recently commenced, but in each case considerable effort had been made, and an earnest desire existed for improvement.

The city of Bombay has made very great progress in femal emancipation during the last 10 years. This is not a matter of surprise when we know that 15 years before that period Native gentlemen themselves, chiefly members of the Students' Society, had inaugurated female education under immense difficulties, and had steadily persevered in their efforts, notwithstanding very great discouragements. The Parsi portion of the community are not shackled by the same social customs as the Hindus, and though the older members of their society are perhaps equally conservative, yet so many of them have visited England and travelled elsewhere, in some cases taking their families with them, that the seclusion of the ladies, which was painfully observable on my first visit, has now greatly disappeared. This was very evident at the enthusiastic public reception given to His Royal Highness the Prince of Wales on his recent visit. Judge Manockjee Cursetjee has contributed not a little to this change by his devoted efforts during more than 30 years, to improve female education in his own family first, and then by the establishment of the Alexandra school, in which the English language is the basis of the instruction given, with English teachers. This system has not, however, yet taken root among his countrymen. The large Jamsetjee Jeejeebhoy schools are still taught the vernacular only, and by male teachers, in large classes of 30 or 40 or more girls. A Parsi gentleman informed me, however, that in four Parsi schools Native Female teachers are employed, several of them being young Parsi ladies brought up in the schools. Many of these might become good teachers if skilled training were obtained for them, which is not the case. The Hindus also have made considerable progress. While formerly the family of Dr. Atmaram Pandurang stood almost alone, now there are many families which are allowed considerable liberty. As an instance of this, may be mentioned the fact that frequent gatherings of such ladies meet at the house of Dr. Atmaram, and the gentlemen of the families are not excluded.

I met one such party when from 30 to 40 were present. The spread of education among women of a lower class is proved by the fact that Dr. Hunter has opened two classes for the training of Native midwives. None are admitted who cannot read and write the vernacular; they undergo a scientific training, and then are practised in the hospital. Many of these women have been very successful, and obtain a good living. But while there is evidence in many ways of the spread of education, and of an increased public opinion in favour of it, the Hindu schools themselves are in no way improved; on the contrary, they seemed to me in a condition inferior to that in which they were at my first visit, when the late learned Dr. Bhaudaji and other Native gentlemen took a warm interest in the management of them. A few Native women assist in the teaching in them, but the teachers are generally very inferior, and the premises quite unsuitable. Native gentlemen feel themselves powerless to raise the schools, nor indeed can this be done unless some really good trained lady teacher is provided by the Government. I conversed with many Native gentlemen on the subject, and am satisfied that they will gladly co-operate if any help is given for the improvement of female education.

The general impression I have formed from my present visit to India on the subject of female education, is a very hopeful one. The idea of education seems increasingly to permeate the masses from high to low. Native chiefs are thinking of the education of their ladies, and a single instance in which they carry this into effect is more valuable than any mere professions of interest. Native gentlemen of position are, in many cases, anxious to obtain for their ladies instruction from English ladies. The class of women requiring to obtain a maintenance find that they can do so better by being educated. I have formed a much higher idea than before of the capabilities of Native ladies, both in acquiring knowledge and in becoming teachers. There is not the great dread of female education which formerly existed, and altogether the way appears open to rapid progress, if only the conditions necessary to this are provided. These conditions are in the first place a good teaching power, with suitable premises and appliances; these cannot be supplied by the Natives, and without them the schools for girls will continue as they have done, without any sensible improvement.

When the Government decided on establishing male education in India on the British system, educated English gentlemen and well-trained schoolmasters were obtained, who inaugurated the various schools and colleges. Native masters were trained both in these and in numerous normal schools, these again trained others. At Ahmedabad, the principal of the male normal school, Mr. Mahiputram Rufram, was sent to England many years ago, and spent some months in a good training college, where he thoroughly mastered the English system. On my first visit to India, I was surprised to find how admirably he was carrying out this among the young men who practised the art of teaching in a school connected with the institution. At present, in new premises, with which is connected a boarding-house for the students, he is admirably preparing a number of young men to go out as valuable teachers into the Mofussil schools. Many middle-aged Native gentlemen have told me how valuable was the mental and moral influence they had received from the English gentlemen at the head of the colleges and high schools where they were brought up; they in their turns have imparted this to others, if not as heads of schools, in whatever sphere of life they may be placed.

The Government has not yet adopted this course to promote the education of the female sex, a course which has been so successful with the male portion of the community. I am quite aware that until lately the Government would not have felt it right to do anything of the kind, lest they should be regarded as interfering with the social customs of the country. But that time is past. The girls are freely sent to school in many parts of the country, and my brief narrative must have proved to your Lordship that a desire is widely spread for education, and in many parts for a higher education than can possibly be obtained without help. It is so contrary to the social customs of the Hindus to have girls taught by men after a very early age, and so evidently improper in itself considered, that mothers decidedly prefer female teachers, even if these are of an inferior quality, or of another religion; and owing to the removal of the young girls at so early an age from schools taught by men, very little progress

gress can be made from generation to generation until suitable schools, taught by female teachers, are provided.

This is so very apparent that it is a matter of surprise that so little has been hitherto done in India to supply a proper teaching power to the existing girls' schools, and that no good model schools have been established by the Government. The only objections that have been made to me when urging the supply of suitable teachers have been "want of funds," and the difficulty of obtaining suitable female teachers.

Respecting the first of these objections, "want of funds," I am well aware that there is a great need of economy in India. But this felt necessity does not prevent the erection in the chief cities of magnificent and costly buildings, when plain and inexpensive ones might well have answered the purpose. These I saw everywhere with wonder and admiration, newly erected since my former visit. Indeed I was strongly impressed with the opinion that money can always be forthcoming in India for objects which are really desired. There is, however, an evident apathy on this subject, as an unnecessary and extraneous one. It is forgotten how many years are wasted to the population from the want of home training and proper development of the child, consequent on the ignorance of the mothers; and that the degraded condition of one-half of the inhabitants must have a baleful influence on the other half. With respect to the other objection, the want of female teachers and the difficulty of obtaining them, this may be met by the employment of proper means, which have not yet been adopted.

There does not appear to be in India a sufficient appreciation of what is required to constitute a good female teacher. It seems to be thought sufficient for those who are to become female teachers to have acquired certain knowledge, and to be able to pass the appointed examinations. But education is a science, and an art, and ought to be studied in each of those aspects. This is understood in England; and no labour or expense is spared in the training of teachers. It is here understood that a teacher who understands the art of teaching will communicate knowledge and train the faculties of the young girl with much more facility, and in a much more agreeable way, than those who have not been thus trained. Our infant school system would be peculiarly adapted to Hindu children. This is not understood in India, nor did I hear of any school of the kind existing. The lady superintendents of the female normal schools have not been trained in the English system, and consequently cannot teach it.

The first step, then, should be to have some well-trained English mistresses sent over to India. Great care would, of course, be required in the selection. If the Local Government were to establish one good school with such a mistress wherever the need existed, such a mistress would soon be able to train others as assistants in the schools. Without commencing a new school, such a mistress might superintend some existing schools, and with the help of an Anglo-vernacular master, introduce a good system into the schools, training pupil teachers at the same time. Such a teacher appointed for the four Vizianagram girls' schools at Benares, of which Mrs. Etherington is superintendent, would render a separate normal school unnecessary, as the women in training could all be trained in the school much better than separately. Such a teacher at Ahmedabad and at Surat for the girls' schools would soon bring them into a state of efficiency, as that at Ahmedabad was when under an English lady superintendent. In Bombay one trained mistress for the Hindu girls' schools, and another for the Parsi schools, co-operating with the existing Native managers, would soon establish an improved condition of female education. With a few such training institutions in the Presidency of Bombay, a system of higher education might be organised, and female teachers could be prepared, without increasing the number of female normal schools. The introduction of some trained and efficient teachers is, then, of immediate necessity; but this will not alone be sufficient.

While I quite believe in the possibility of preparing Native women to be efficient teachers, yet at present those who are fit to be so trained are isolated cases, and will not meet the rapidly increasing demand. I should then recommend that one good normal training school should be established by the Government, in which young women of education, whether English,

Eurasian, or Native Christians, should receive a good training as teachers. There are in India a large number of young women, daughters of officials, orphans, and others, who have received a fair education in English schools. At present they have rarely any opportunity of getting a livelihood, but from having been brought up in the country, and acquainted with a vernacular, they would be much better prepared than strangers to enter on the duty of teaching. ✓ At Madras we saw that Eurasians and Native Christians were admitted to the normal school with Hindus. But this was an exceptional case, and would not be desirable in general. They might all be admitted to the Government normal school, on producing satisfactory testimonials, and undergoing the appointed examinations, as is done in our own country. Such young women, being previously well trained, would save great expense by supplying all the English schools with teachers, who are now brought at great expense from England, and many would, if accomplished and ladylike, be sought for as governesses to Ranees or Native ladies of superior condition. I will not trouble your Lordship with the details of such an institution, but an experience now of 10 years increases my conviction that we ought to prepare female teachers from the material now in the country. I trust that your Lordship and the Indian Government may see fit to carry out such a plan.

One plan more I would suggest. I have mentioned the great benefit derived by Mahiputram Rufram from visiting the English training schools. He has repeatedly assured me that no descriptions could have enabled him to understand the system without personally inspecting it and working in the schools. There are now to be found some Native women who have gained such experience and culture, with a knowledge of English, as would make a year's visit to England of great value to them. I saw such at Poona and at Madras. There may be some in Bombay and Calcutta. If the Government would arrange the expense of sending over some on fixed conditions, they might derive great benefit, which they would communicate to others.

I have already informed the Directors of Public Instruction in Bombay and in Madras that I would undertake, with my friends, to superintend the arrangements for such students in England.

I need not add that provision should be made to supplement the salaries raised from municipal rates, by Government grants for efficient teachers, so as to secure for them adequate remuneration for good teaching.

Trusting that your Lordship will give this important subject full consideration, and commend it to the notice of the Indian Government,

I beg, &c.
(signed) *Mary Carpenter.*

Red Lodge House, Bristol,
30 August 1876.

EAST INDIA (PRISON DISCIPLINE).

COPY of the REPORT to Marquis of Salisbury by
Miss Mary Carpenter on PRISON DISCIPLINE,
and on FEMALE EDUCATION in India.

(*Mr. Wain.*)

*Ordered, by The House of Commons, to be Printed,
2 May 1877.*

185.

Under 3 oz.

EAST INDIA (RELEASE OF PRISONERS).

449

RETURN to an Address of the Honourable The House of Commons,
dated 5 March 1877;—for,

“COPY of NOTIFICATIONS by the Government of India, dated the 1st day of January 1877, relating to the RELEASE of PRISONERS on the Occasion of the Assumption of the Title of EMPRESS of INDIA by HER MAJESTY the QUEEN.”

India Office,
6 March 1877. }

GEORGE HAMILTON,
Under Secretary of State.

HOME DEPARTMENT.

NOTIFICATIONS.

EXTRACT from the Proceedings of the Government of India in the Home Department, No. 37 c, dated Camp, Delhi, 1 January 1877.

RESOLUTION.

THE Viceroy and Governor General in Council has resolved to release a certain number of prisoners, and to remit a certain number of sentences against criminals in all the gaols throughout India, in the Penal Settlement of Port Blair, and, in the case of convicts sentenced in India, in the Straits Settlements, on the 1st proximo, as an act of clemency and grace, on the auspicious occasion of the assumption of the title of Empress of India by Her Majesty the Queen.

2. In this view, the cases of the following three different classes of prisoners in the gaols in India have come under consideration :—

- I.—General Offenders.
- II.—Civil Prisoners.
- III.—Political Prisoners.

I.—General Offenders.

3. As regards general offenders, the Governor General in Council has directed that 10 per cent. of all the prisoners under confinement in each Province shall be released; care being taken that the number released be spread as evenly as possible over all localities, and that the following be excluded from the amnesty, namely :—

1st. Those whose conduct during imprisonment in gaol has been bad and turbulent;

2nd. Those whose crimes are (like thuggee or dacoitee) excepted from recommendation for release after 20 years' imprisonment at Port Blair, and those whose release is likely to give rise to a renewal of blood-feuds, or other disturbances of the public peace;

3rd. Professional and habitual criminals, and prisoners convicted more than twice.

4. Three classes of general offenders, European or native, have been, as far as possible, selected for release under the 10 per cent. order, namely :

1st. Those who have generally borne a good character, but have been led under sudden impulse to commit crimes, such as riot, affray, assault, or culpable homicide; women who have committed infanticide to hide their shame, and the like;

2nd. Those whose crimes were committed at an early age, and without the display of any special depravity;

3rd. Those whose crimes were of a grave character but have been expiated to some extent by long imprisonment with good behaviour. Under this head may be included a few life-convicts who have undergone imprisonment for 20 years, and who have generally behaved well throughout the period of their confinement.

5. Under these general instructions, Local Governments were authorised to select the criminals to be released under the 10 per cent. rule, a special officer in each Province being charged with the duty.

6. As regards partial remissions of sentences, all persons under sentence of one month's imprisonment or less, who have worked out half their sentence on or before 1st proximo, are to be released on that date without exception.

7. All persons under sentence of above one month's imprisonment and up to six months or less, have been granted a remission of 15 days. All persons under sentence of above six months' imprisonment have been granted a remission of one month. All persons under sentence of above a year's imprisonment have been granted a remission of one month for each year of their sentence; all remissions granted under these orders being restricted to well-conducted convicts. Under no circumstances has the boon been extended to such criminals as have been more than twice convicted; or to those who have been committed to gaol as security for keeping the peace; or to any person whose premature release may be deemed by the local authorities to be inexpedient for reasons of local importance.

II.—*Civil Prisoners.*

8. As regards civil prisoners, the Governor General in Council has been pleased to order the release of all those whose debts do not exceed the sum of 100 rupees, and the payment by Government of the debt or debts for which they are detained.

III.—*Prisoners at Port Blair.*

9. As regards the prisoners under this head, the Superintendent of Port Blair has submitted lists prepared in accordance with the instructions issued in the case of prisoners in India, and with special recommendations in the case of those who are not disqualified from the amnesty. These lists have been circulated to Local Governments and Administrations, so that the fullest consideration has been given to each individual case. Acting upon the information so obtained, the Governor General in Council has directed that 278 male life-convicts and 90 female shall be absolutely released; term-convicts, 65, male and female, and one Christian convict, or 434 in all.

10. Besides absolute releases, the Superintendent of Port Blair has been allowed to grant to well-behaved convicts in Port Blair, to the extent which he deems expedient, freedom within the limit of the Settlement, and, moreover, to give promotion in their respective classes to prisoners in the earlier stages of their probation.

11. As regards Indian convicts in the Straits Settlements, very full inquiries have been made. A special officer has been deputed to Singapore to confer with the Straits Government in view to re-consider the cases of all Indian convicts undergoing sentence in that Province. This officer, Mr. Brodhurst, of the Bengal Civil Service, has prepared lists of all the Indian convicts in the Settlements, and as in the case of the Port Blair prisoners, these lists have been forwarded for the opinions of the Local Governments to which the prisoners belong. The result of this inquiry is that 221 have been absolutely released.

12. In Sarawak four Indian convicts have been absolutely released, and in Madras seven Straits convicts, and in Bombay five. Thus the grand total of absolute releases of prisoners in transportation is 671.

13. The number of political prisoners in India is very small, and, indeed, most of these are not really in confinement, but reside under surveillance in places fixed for their residence.

It has been, however, found possible to grant entire freedom to Sirdars Kishan Kooer and Narain Singh, of the Punjab, and to give similar boons to others residing in various places.

14. Special instructions have been issued to all Local Governments that the arrangements for the release of prisoners shall be carried out circumspectly and quietly, the prisoners being conducted to their homes in small batches, and when practicable under police supervision.

15. The net result of these orders will approximately be as follows :—

(a) Prisoners, including civil and political prisoners, released by Local Governments and Administra- tions	- - - - -	15,317
(b) Released at Port Blair	- - - - -	434
(c) Prisoners released in the Straits and elsewhere	- - - - -	237
Total		<u>15,988</u>

ORDER.

Ordered,—That this Resolution be published for general information, and forwarded to the Local Governments and Administrations noted in the margin.*

EXTRACT from the Proceedings of the Government of India in the Home Department, No. 38 c., dated Camp, Delhi, 1 January 1877.

RESOLUTION.

THE Viceroy in Council having considered the terms of the amnesty granted in 1859, is pleased to announce that the exception from the amnesty of persons who were leaders of revolt is withdrawn, and that such persons may now return to their respective homes on the sole condition of announcing their return to the district authorities, and of good behaviour for the future. Such persons will, however, be required, if they wish to leave the limits of the district in which they reside, to give previous notice to the district authorities.

The exception as to murderers and leaders of mutiny will still remain in force, and nothing in the above Notification will extend to Feroz Shah, the son of the late King of Delhi.

* Madras, Bombay, Bengal, North-Western Provinces, Punjab, Oudh, Central Provinces, British Burmah, Mysore and Coorg, Assam, Hyderabad Assigned Districts.

EAST INDIA (RELEASE OF PRISONERS).

COPY of NOTIFICATIONS by the Government of India, dated 1 January 1877, relating to the Release of PRISONERS on the Occasion of the Assumption of the Title of EMPRESS of INDIA by HER MAJESTY the QUEEN.

(Mr. Mitchell Henry.)

*Ordered, by The House of Commons, to be Printed,
7 March 1877.*

STATEMENT

EXHIBITING THE

MORAL AND MATERIAL PROGRESS AND CONDITION

OF

INDIA

DURING THE YEAR 1875-76.

(PRESENTED PURSUANT TO ACT OF PARLIAMENT.)

Ordered, by The House of Commons, to be Printed,
31 July 1877.

TABLE OF CONTENTS.

I. ADMINISTRATION AND LEGISLATION.

ADMINISTRATION :	PAGE
Bengal	1
Madras	1
Punjab	1
Berar	1
British Burma	2

MUNICIPALITIES :	PAGE
Bengal	2
Madras	2
Bombay	2
Punjab	3
North-West Provinces	3
Oude	3
Ajmere	3
Central Provinces	3
Berar	4
British Burma	4

LEGISLATION :	PAGE
Government of India	4
Bengal	5
Madras	5
Bombay	5

II. JUSTICE AND POLICE.

STATE OF CRIME :	PAGE
Bengal	6
Madras	6
Bombay	6
Punjab	7
North-West Provinces	7
Oude	7
Ajmere	7
Central Provinces	7
Berar	7
Coorg	7
British Burma	7

INFANTICIDE :	PAGE
Bombay	8
North-West Provinces	8
Oude	9

MAGISTRATES :	PAGE
Bengal	9
Punjab	9
Ajmere	9
Central Provinces	9

POLICE :	PAGE
Bengal	9
Madras	10
Bombay	10
Punjab	10
North-West Provinces	10
Central Provinces	10
Berar	10
British Burma	10

II. JUSTICE AND POLICE—continued.

JAILS :	PAGE
Bengal	11
Madras	11
Bombay	11
Punjab	11
North-West Provinces	12
Oude	12
Ajmere	12
Central Provinces	12
Berar	12
British Burma	13

CIVIL JUSTICE :	PAGE
Bengal	13
Madras	13
Bombay	13
Punjab	14
North-West Provinces	14
Oude	14
Ajmere	14
Central Provinces	14
Berar	15
British Burma	15

III. FINANCE.

REVENUE AND EXPENDITURE	16
OPIMUM AND EXCISE :	PAGE
Bengal	16
Bombay	17
Central Provinces	17

SALT :	PAGE
Bengal	17
Madras	18
Bombay	18
Central Provinces	18

BENGAL ROAD CESS	19
DEPRECIATION OF SILVER	19

IV. LAND ADMINISTRATION.

GREAT TRIGONOMETRICAL SURVEY	20
TOPOGRAPHICAL SURVEYS	20
REVENUE SURVEYS :	PAGE
Government of India	20
Madras	20
Bombay	20
Punjab	20
Berar	20
Coorg	20

LAND REVENUE :	PAGE
Bengal	21
Madras	21
Bombay	21
Punjab	21
North-West Provinces	21
Oude	21
Central Provinces	21
Berar	21
British Burma	22

IV. LAND ADMINISTRATION—*continued.*

LAND TENURE :	PAGE
Bengal - - - - -	22
Madras - - - - -	22
Bombay - - - - -	23
Punjab - - - - -	23
Central Provinces - - - - -	23

INDEBTEDNESS OF THE CULTIVATING CLASS :	PAGE
Bombay - - - - -	23
Punjab - - - - -	24
Central Provinces - - - - -	24

GOVERNMENT AND WARDS' ESTATES :	PAGE
Bengal - - - - -	25
Madras - - - - -	25
Punjab - - - - -	25
North-West Provinces - - - - -	25
Oude - - - - -	25

V. AGRICULTURE.

SEASONS AND CROPS :	PAGE
Bengal - - - - -	26
Madras - - - - -	26
Bombay - - - - -	26
Punjab - - - - -	27
North-West Provinces - - - - -	27
Oude - - - - -	27
Ajmere - - - - -	27
Central Provinces - - - - -	27
Berar - - - - -	27
Coorg - - - - -	28
British Burma - - - - -	28

MODEL FARMS :	PAGE
Bengal - - - - -	28
Madras - - - - -	28
Bombay - - - - -	28
Central Provinces - - - - -	29

AGRICULTURAL STOCK :	PAGE
Bombay - - - - -	29
Punjab - - - - -	29
British Burma - - - - -	99

COTTON :	PAGE
Madras - - - - -	29
Bombay - - - - -	30
Central Provinces - - - - -	30

CHINCHONA :	PAGE
Bengal - - - - -	30
Madras - - - - -	31

TEA :	PAGE
Bengal - - - - -	31
Punjab - - - - -	31

TOBACCO :	PAGE
North-West Provinces - - - - -	31

FORESTS :	PAGE
Bengal - - - - -	31
Madras - - - - -	32
Bombay - - - - -	32
Punjab - - - - -	32
North-West Provinces - - - - -	32
Assam - - - - -	32
Central Provinces - - - - -	33
Berar - - - - -	33
British Burma - - - - -	33

VI. PUBLIC WORKS.

IRRIGATION :	PAGE
Bengal - - - - -	34
Madras - - - - -	34
Bombay - - - - -	34
Punjab - - - - -	34
North-West Provinces - - - - -	34

VI. PUBLIC WORKS—*continued.*

RAILWAYS :	PAGE
East Indian Railway - - - - -	34
Bengal Railways - - - - -	35
Madras Railways - - - - -	35
Bombay Railways - - - - -	35
Punjab Railways - - - - -	36
North-West Provinces and Oude Railways - - - - -	36
Rajpootana State Railway - - - - -	36

ROADS AND BRIDGES :	PAGE
Bombay - - - - -	36
Punjab - - - - -	36
Central Provinces - - - - -	36

MADRAS HARBOUR - - - - -	37
--------------------------	----

PAUMBEN CHANNEL - - - - -	37
---------------------------	----

OYSTER REEF LIGHTHOUSE - - - - -	37
----------------------------------	----

MARINE SURVEYS - - - - -	37
--------------------------	----

VII. MINERAL RESOURCES.

COAL :	PAGE
Bengal - - - - -	38
Central Provinces - - - - -	38

IRON :	PAGE
Central Provinces - - - - -	38

GOLD AND TIN :	PAGE
British Burma - - - - -	38

VIII. MANUFACTURES.

COTTON :	PAGE
Bengal - - - - -	39
Bombay - - - - -	39
Berar - - - - -	39

SILK :	PAGE
Bengal - - - - -	39
Punjab - - - - -	39

IX. TRADE.

FOREIGN TRADE OF BRITISH INDIA - - - - -	40
--	----

TRADE :	PAGE
Calcutta - - - - -	41
Chittagong - - - - -	43
Orissa - - - - -	43
Bengal Inland Trade - - - - -	43
Madras - - - - -	43
Bombay - - - - -	44
Sind - - - - -	46
Punjab - - - - -	46
Oude - - - - -	46
Ajmere - - - - -	46
Central Provinces - - - - -	47
British Burma - - - - -	47

TRADE WITH THIBET - - - - -	47
-----------------------------	----

TRADE WITH EASTERN TURKESTAN - - - - -	47
--	----

TRADE THROUGH LADAKH - - - - -	48
--------------------------------	----

X. PUBLIC HEALTH AND SANITATION.

EUROPEAN ARMY - - - - -	49
-------------------------	----

NATIVE ARMY :	PAGE
Bengal - - - - -	49
Madras - - - - -	49
Bombay - - - - -	49

X. PUBLIC HEALTH AND SANITATION— *continued.*

HEALTH OF GENERAL POPULATION :	PAGE
Bengal - - - - -	49
Madras - - - - -	50
Bombay - - - - -	50
Punjab - - - - -	50
North-West Provinces - - - - -	50
Oude - - - - -	50
Central Provinces - - - - -	50
Berar - - - - -	50
British Burma - - - - -	50

VACCINATION :	
Bengal - - - - -	51
Madras - - - - -	51
Bombay - - - - -	51
Punjab - - - - -	51
North-West Provinces - - - - -	51
Oude - - - - -	52
Central Provinces - - - - -	52
British Burma - - - - -	52

HOSPITALS AND DISPENSARIES :	
Bengal - - - - -	52
Bombay - - - - -	52
Punjab - - - - -	52
Oude - - - - -	52
British Burma - - - - -	52

LUNATIC ASYLUMS :	
Bengal - - - - -	53
Madras - - - - -	53
Punjab - - - - -	53
British Burma - - - - -	53

MEDICAL SCHOOLS :	
Bengal - - - - -	54
Madras - - - - -	54
North-West Provinces - - - - -	54
Oude - - - - -	54

SANITATION :	
Bengal - - - - -	54
Madras - - - - -	55
Bombay - - - - -	55
Punjab - - - - -	55
North-West Provinces - - - - -	55
Central Provinces - - - - -	55

XI. EMIGRATION.

EMIGRATION :	
To the Colonies - - - - -	56
To the Tea Districts - - - - -	57
To British Burma - - - - -	57

XII. EDUCATION.

STATE OF EDUCATION :	
Bengal - - - - -	58
Madras - - - - -	58
Bombay - - - - -	58
Punjab - - - - -	59
North-West Provinces - - - - -	60
Oude - - - - -	60
Ajmere - - - - -	60
Central Provinces - - - - -	60
Berar - - - - -	61
Coorg - - - - -	61
British Burma - - - - -	61

UNIVERSITIES :	
Calcutta - - - - -	61
Madras - - - - -	62

XII. EDUCATION—*continued.*

UNIVERSITIES— <i>cont.</i>	PAGE
Bombay - - - - -	62
Punjab University College - - - - -	62

MAHOMEDAN EDUCATION :	
Bengal - - - - -	62
Bombay - - - - -	62
North-West Provinces - - - - -	62
Berar - - - - -	62

FEMALE EDUCATION :	
Bengal - - - - -	62
Madras - - - - -	62
Bombay - - - - -	62
Punjab - - - - -	63
North-West Provinces - - - - -	63
Oude - - - - -	63
Central Provinces - - - - -	63
British Burma - - - - -	63

LITERATURE AND THE PRESS :	
Bengal - - - - -	63
Bombay - - - - -	63
British Burma - - - - -	63

XIII. NATIVE STATES.

NATIVE STATES :	
Hill Tipperah - - - - -	65
Cooch Behar - - - - -	65
Tributary Mehals - - - - -	65
Cashmere - - - - -	66
Simla Hill States - - - - -	66
Puttiala - - - - -	66
Kuppoorthulla - - - - -	66
Bhawulpore - - - - -	66
Rajpootana States - - - - -	66
Oodeypore - - - - -	66
Jeypore - - - - -	67
Jodhpore - - - - -	67
Kotah - - - - -	67
Bhurtpore - - - - -	67
Dholepore - - - - -	67
Ulwur - - - - -	67
Bickaneer - - - - -	67
Serohi - - - - -	67
Central India States - - - - -	67
Gwalior - - - - -	68
Indore - - - - -	68
Rewah - - - - -	68
Bombay States - - - - -	68
Baroda - - - - -	70
Kutch - - - - -	71
Kattywar - - - - -	71
Pahlunpore - - - - -	72
Mahee Kanta - - - - -	72
Rewa Kanta - - - - -	72
Sucheen - - - - -	72
Junjeera - - - - -	72
Sattara - - - - -	72
Kolhapore - - - - -	73
Sawunt Waree - - - - -	73
Southern Mahratta States - - - - -	73
Mysore - - - - -	73
Cochin - - - - -	74
Travancore - - - - -	74

XIV. FRONTIER RELATIONS.

FRONTIER RELATIONS :	
North-East Frontier - - - - -	76
North-West Frontier - - - - -	76

STATEMENT

EXHIBITING THE

MORAL AND MATERIAL PROGRESS AND CONDITION OF INDIA

DURING THE YEAR 1875-76.

I.

ADMINISTRATION AND LEGISLATION.

The welcome given by all classes in Bengal to the Prince of Wales was an assuring evidence of the loyalty of the people towards the British Government. The wealthier Natives in different places raised large subscriptions to commemorate the event by founding educational institutions, and by promoting other works of public usefulness. ADMINIS-
TRATION.
Bengal.

Two appointments ordinarily reserved for Civil Servants were conferred on Natives of good position, character, and experience. Sir R. Temple is a strong advocate of this policy, and intends carrying it out in the future, with due regard to the claims of British officers now in the service.

In the Uncovenanted Service the higher classes of Native officers maintained their character for integrity.

It was determined that, in future, only Natives who are graduates of the University should, as a rule, be appointed to the superior posts in either the judicial or the executive branch. Sir R. Temple anticipated much advantage to the service as the effect of this measure.

The decision, mentioned in the last Report (p. 2), to offer for competition annually a fixed number of places in the Subordinate Executive Service was acted on in the year under report. Five successful candidates were immediately provided with appointments. These subordinate establishments are stated to be exceedingly useful, and to supply a want which had long been felt in the Lower Provinces.

The system of concentrating in the Magistrate and Collector all powers and functions within the limits of his district continued in force. The importance of this concentration outweighed, in Sir R. Temple's opinion, the objections expressed in some quarters, while, at the same time, the magistrates were reminded that they must be careful to evince forbearance and consideration in the exercise of their greatly extended authority. The subdivisional system was completed throughout the province, and its merits appeared to be universally acknowledged.

On the 27th April 1875 Lord Hobart died, after holding office for nearly three years as Governor of Madras, and he was succeeded on the 23rd November following by the Duke of Buckingham. During the interval between those dates the administration was conducted by Mr. (now Sir W.) Robinson. Madras.

The scheme referred to in the last Report (p. 2) for the increase of the judicial staff and the partial separation of judicial and executive functions in the Punjab worked successfully during its first year of operation. Deputy Commissioners are now free to devote a larger portion of their time to the administration of their districts and to the management of revenue matters. It is not considered that it would be advisable to entirely relieve the magistrates in this province of criminal judicial powers, which in the eyes of the Natives constitute the most important part of their authority. Punjab.

Mr. Saunders, on his appointment to the Chief Commissionership of Mysore, was succeeded as Resident at Hyderabad on the 4th December 1875 by Sir Richard Meade. Berar.

British
Burma.

On the 17th April 1875 Mr. Rivers Thompson succeeded the Hon. Ashley Eden as Chief Commissioner of British Burma, Mr. Eden having been appointed a member of the Governor-General's Council.

In the Administration Report for 1875-76 the following remarks are made with regard to the administration of this portion of Her Majesty's Eastern possessions:—

"Though our rule in Burma becomes gradually more consolidated year by year upon the principles and procedure of older provinces, it cannot be overlooked that in this, the latest pendant to our Indian dominion, there are many administrative axioms based on a community of race and religion, on a similarity of tastes and traditions, which fail entirely of application. Burmese administration has its special conditions, demanding in many things political appliances, and perhaps the greatest risk incurred is lest among a primitive agricultural race the sudden influx of material prosperity and wealth, and the sudden introduction of modern rule and requirements, should actually retard a natural and healthy development."

MUNICIPALITIES.
Bengal.

The year 1875-76 was the last of the old municipal corporation of Calcutta, which consisted of the 129 Justices of the Peace. It was felt that the corporation did not sufficiently represent various classes in the community who, by their growing wealth, their improved education, and other claims, were entitled to a definite voice in the management of the city. An Act was therefore passed for establishing a new municipal constitution, and a corporation consisting of 72 Commissioners, of whom two-thirds should be elected, and one-third appointed by Government. Since the close of the year the first elections were held; a considerable portion of the electors voted, and a fairly representative body of Commissioners was returned. As, however, but few Europeans were elected, the desired proportion was made up by the appointments of the Government.

In 1875 the Chairman, in accordance with the opinion of some members of the corporation, ordered a re-assessment of the town. As this measure affected the interests of a large number of ratepayers, it was loudly censured, but the result proved its necessity. The aggregate annual increase to the municipal income amounted to no less than 14,239%.

The ordinary income of the municipality for 1875 was 292,174%, being higher than that of 1874 by 25,335%; the total amount at the disposal of the corporation was 408,215%. The ordinary expenditure reached 336,035%; adding that chargeable to capital account, the total was 386,802%.

The Act for reconstituting municipalities in the interior was also passed, but did not come into operation until after the close of the year. This Act, while not providing for any increase of taxation, gives extended powers to Commissioners in regard to the expenditure of municipal funds.

There were 192 provincial municipalities, of which the aggregate income was 185,797%, exceeding that of the previous year by 4,797%. There was a slight increase in the number of non-official and Native members of committees, but the difficulty of securing suitable persons still continued. As a rule the committees worked with zeal and vigour, and showed a fair degree of interest in measures affecting the improvement of their towns.

Madras.

The ordinary receipts of the Madras Municipality in 1875-76 were 56,060%. The conservancy of the town was properly attended to. In the expectation of Mr. Clark's drainage scheme being shortly carried out, very little work was done in that line.

The provincial municipalities showed an advance in efficiency. The aggregate income was 113,637%. The collections from tolls do not fall entirely on residents within municipal limits, and it has been determined that in future a certain proportion of these receipts shall be made over to Local Fund Boards. Of the available income, 38 per cent. was spent on sanitation, and 28 per cent. on new works and repairs, but only 5 per cent. on education.

Bombay.

Including the capital, there were 10 city municipalities in the Bombay Presidency (of which four were in Sind) and 170 town municipalities. The former comprise the great trading centres.

Bombay is administered under a special Act, which gives to the citizens the privilege, to a great extent, of electing their representatives; and the Government state that they have no reason to regret this measure when they compare the present state of the city with what it once was. The total income of 1875 was 314,352%, of which 231,808% was raised by taxation proper. Town duties produced 67,299%, or 18,734% more than in 1874; this increase was partly owing to the enhanced tariff value of some of the articles imported. The fall in the rateable valuation of house property continued, and further affected the municipal revenue. Building was said to be going on at the rate of about 300 new houses a year. The halalcross (or scavenging) cess, however, increased by nearly 800%, in consequence of the extension of this service to Malabar Hill and other parts of the city. There were 230 new water-connexions made during the year. The night-soil depôt at Carnac Bunder was greatly improved; the

building was reconstructed and roofed in, the pipe to the sea was relaid, and engines and pumps were erected to flush the depôt with sea-water. In the Health Department a very high degree of efficiency was maintained at a reduced cost. A large portion of the street sweepings was utilised in the reclamation of land, from which a considerable rental is derived.

In the other city municipalities also great improvements have been effected, and particularly at Poona, where the construction of the great irrigational dam at Kurruckwasla has proved of immense advantage.

In the towns generally municipal government is not popular, any amount of filth or inconvenience being preferred to the imposition of a direct tax; eight new municipalities were, however, opened during the year. A large portion of the revenue is raised by a light octroi, to which, as a remnant of the old transit duties, but little objection is felt, while efforts are made to prevent it from acting as a transit duty. It is, moreover, being annually more and more relieved by assessed rates. In the Presidency proper the incidence of taxation is slight; it is considerably higher in Sind than elsewhere.

The number of municipalities in the Punjab at the close of the year was 196. Of a total Punjab. income of 203,043%, the portion derived from octroi was 170,679%; this was the sole source of taxation in 154 towns. In all the important municipalities the octroi was collected under direct management; in several of the minor towns the collection continued to be leased to contractors, because of the disproportionate cost that would otherwise have been entailed by establishments.

In the North-West Provinces the number of municipal towns in 1875-76 was the same as North-West Provinces. in the preceding year. In most of them the members of the committee are elected by the inhabitants. The aggregate income of the year was 203,651%. Of the expenditure, 33 per cent. was on public works; much useful work was done in paving and draining. There was a considerable sum in reserve at the close of the year, owing to the committees saving up money for large works of local improvement; the Government, however, expressed an opinion adverse to this policy.

Octroi amounted to 88·8 per cent. of the total receipts; the per-centage was slightly less than that of the preceding year, but the actual amount was greater, in consequence chiefly of large importations, especially of grain, owing to the good harvests of the year. It was levied in all but nine municipalities, and in 55 it was the only tax in force. In some cases articles were exempted from taxation because it was found that the system of refunds did not protect the through trade. In one town the octroi was altogether abolished, and a tax on "circumstances and property" substituted. Tobacco was exempted in another town, and metals in two others.

Besides the municipalities, there were 318 towns providing for their administration on a small scale out of funds raised by a kind of income tax on the townspeople. Although this tax is not a popular one, its incidence is very light, and it is the means of gradually effecting much improvement in the condition of the towns.

With the exception of Lucknow and Fyzabad, all the municipalities in Oude are small. Oude. The privilege of electing members does not appear to be appreciated as yet. For an election at Lucknow only seven votes were recorded, and the members were in consequence nominated.

The total receipts for the year were 41,321%, against 44,762% for 1874-75. Although the total amount was less, octroi yielded 33,753%, against 31,903%.

Octroi was also levied, under the authority of Government, in several towns not having a municipal constitution.

The municipal income of both Ajmere and Beawur showed a considerable increase; in the Ajmere. former case it advanced, as compared with the preceding year, from 3,684% to 4,812%, and in the latter from 1,686% to 1,954%. This improvement is stated to be the result partly of the opening of the railway to Ajmere, and partly of the substitution of direct collection of the octroi for the farming system. By far the greatest part of the taxation is in the form of octroi, the profits from which steadily increase. Careful inquiry was made during the year respecting the incidence of this tax, with the result that it was not found to be injuring trade; and it is said to be collected with little friction or discontent.

The committees are reported to manage their affairs efficiently. They did their best to improve the sanitary condition of the towns. The question of a water-supply for Ajmere was considered, but the magnitude of the work would probably necessitate a loan. This city is badly situated for sanitation; on the contrary, the situation of Beawur is favourable, and its water-supply and other arrangements are good and effective.

There was an increase of three to the municipal institutions of the Central Provinces, Central Provinces. making 59 in all. It is the rule that at least two-thirds of the members shall be non-official, but in many cases the privilege of election is not prized, while in some of the smaller towns there is no competition, certain influential citizens having been already long looked

up to as unofficial representatives of their townsmen. In the larger towns more interest is displayed in the elections.

The committees are stated to perform their duties generally with intelligence and energy. While in many instances the official members, from their superior position and experience, take the lead in affairs, the other members are not backward either in council or in action.

In 41 towns octroi was the main or only form of taxation. Under the old Mahratta government a considerable revenue was derived from town and bazaar duties, and hence the people are thoroughly reconciled to a light tax limited to articles consumed in the town itself. The through trade is protected by the refund system. Some of the towns on highways of traffic have imposed a license tax instead of octroi, rather than incur any risk of the latter becoming a burden on goods in transit.

The municipal revenue from all sources amounted to 58,363*l.*, of which octroi yielded 52,499*l.* The distribution of the funds showed that due regard was paid to the important objects of sanitation and education. The condition of many of the towns is stated to be very different from what it was some years ago. The people generally are very apathetic in matters of conservancy, and in this respect the committees were acting a most useful part.

Berar.

The five Berar municipalities were reported to be giving due attention to sanitary and other local matters affecting the health and convenience of the townspeople.

The tax on trades and professions was reduced from 2 to 1 per cent., and some other taxes were introduced or increased by way of compensation. The result was that the receipts during 1875-76 amounted to 7,952*l.*, against 8,011*l.* in 1874-75.

British
Burma.

Consequent on the Act of 24th March 1874, municipalities were established in the seven principal towns of British Burma. As yet but little interest or intelligence is displayed by the Native element in their administration. The aggregate income was 147,230*l.*, of which Rangoon contributed 89,994*l.* One main source of revenue is rent from Government markets, which has a great advantage over the octroi duties levied in other provinces. This form of taxation is entirely in accordance with the temper, tastes, and traditions of the people, and serves, moreover, as a valuable index of the development of retail trade. The other two chief sources of income, common to all municipalities, are the taxes on houses and lands and the proceeds from the sale of licenses.

Rangoon is naturally the most forward of the municipal towns, and the majority of the members of the committee are reported to take an energetic interest in its affairs. Two or three years ago this town contrasted most unfavourably with others of the province, in having all its bazaars in the hands of private speculators, to whom profit and economy were the first considerations. The natural objection to checking individual enterprise in any useful direction long hindered Government from starting any markets of its own in the city. In 1874, however, a first experiment was made in the suburb of Puzoondoung, and a building was completed at a total cost of 2,058*l.* Its success seems far from being assured, and the returns have hitherto been inappreciable. Another large bazaar has been erected on the Strand, at a cost of about 30,000*l.*, under far more prosperous conditions; a profit is expected, estimated at 15 per cent. on the total cost, and no expense has been spared to ensure its continued popularity.

LEGISLA-
TION.
Government
of India.

The Legislative Council of the Government of India passed 18 Acts within the year 1875-76, of which the most important was the Tariff Act, No. XVI. of 1875. By this Act all export duties were abolished, except those on indigo, rice, and lac. With regard to the import tariff the valuations on which duty is assessed were revised, and the general rate for such articles as were not taxed at a specific rate was reduced from 7½ to 5 per cent. The only fresh duty imposed was one of 5 per cent. on long-stapled raw cotton not the produce of continental Asia or Ceylon. In an appendix to the Progress Report for 1873-74 a statement was given showing the several modifications of customs duties that had been effected in past years; the revised tariff will be found in a return made to an order of the House of Commons in 1876 (No. 56). It was estimated that the change of tariff will involve a net loss to the Exchequer of 308,000*l.*, but on the other hand a great benefit will be conferred on trade. Several memorials have been received from Chambers of Commerce praying for the complete abolition of the import duties on cotton, and the Government, while unwilling, for financial and other reasons, to act rashly in the matter, has expressed its concurrence in principle with the desire of the memorialists, and has promised that the gradual remission of the duties shall be carried out as the state of the finances renders it possible.

Acts were passed relating to the courts, and to the land and land revenue, of British Burma, and another regulating the transport of labourers to that province.

Another Act provided for the establishment of reformatory and industrial schools, the benefits of which, however, owing to the peculiar circumstances of India, would be limited to

boys. Three classes of boys may be sent to these schools : (1) boys under 14 convicted of offences punishable with transportation or imprisonment, but not sentenced : (2) boys under 12 sentenced to imprisonment ; (3) boys under 14 who associate with thieves, vagrants, &c., or are without visible means of subsistence. The minimum period for which a boy will be sent to a reformatory school is two years, and the maximum seven years ; but no boy will be detained after he attains the age of 16. Municipalities are empowered, with the sanction of the Local Government, to apply their funds to the establishment or maintenance of the schools, and magistrates of the first class may order the parents of young offenders to contribute a moderate sum for their support.

The last measure of sufficient general interest to be mentioned here was the Native Passenger Ships Act (No. VIII. of 1876), the object of which was to consolidate the four Acts previously in force, and at the same time to make certain amendments. It was found that there was much in the existing law not suitable to the actual shipping arrangements of the day. The principal change made was that the accommodation for passengers is to be determined, not by the tonnage of the vessel, but by the space available. The minimum space prescribed by the Act is 3 square feet of superficies and 54 cubic feet to each passenger. The new Act will have an important bearing on the question of the overcrowding of pilgrim vessels ; and negotiations have for some time past been pending with the Ottoman Government with a view to rules, which shall be in conformity with the Indian Act, being laid down by that Government for the regulation of the pilgrim traffic in the East.

By the Bengal Council five Acts were passed, of which one provided for the survey and demarcation of land, and another for the regulation of irrigation and of the levy of water rates in the provinces subject to the Lieutenant-Governor of Bengal ; another related to the registration of marriages and divorces among Mahomedans. The Calcutta Municipal Act has been referred to above (p. 2). Bengal.

In Madras one Act was passed, and four in Bombay, but none of them were of any public importance. Madras.
Bombay.

II.

JUSTICE AND POLICE.

STATE OF
CRIME.
Bengal.

There was a considerable decrease in the number of offences reported in Bengal; this was ascribed to the absence of the exceptional causes which were at work in 1874 in connexion with the famine. While there was an increase in offences against the person, there was a large decrease in those against property.

A very favourable feature was the great diminution of cases of dacoity, which numbered 236, as compared with 421 in 1874. There were only two instances of murder committed by dacoits; in this respect there has been a rapid improvement since 1872.

The number of prisoners previously convicted was 6,220, or 12·22 per cent. of the whole. Of this number, 3,783 had been convicted once before, 967 twice, and 1,470 more than twice. Of 413 prisoners under 16 years of age, 63 had been previously convicted. Altogether the reconversions increased in the space of four years by no less than 123 per cent.

A Bill having been passed for the establishment of reformatories, the authorities will in future be able to bring all juvenile convicts under educational discipline.

Madras.

In the Presidency of Madras there was an increase of petty offences, but under serious crime improvement was shown, dacoities, house-breakings, and thefts having all decreased. The list of dacoities was 229, the lowest yet recorded. They were mostly committed by Moplahs. The number of false charges of dacoity and robbery exceeded, as usual, the number of true cases. With the decrease of crime there was improvement in detection.

Bombay.

There was a satisfactory decrease of crime in the northern districts of the Bombay Presidency and in Sind. In the latter the improvement was general, except on the frontier. Shikarpur bears an ill repute for murders; of 38 cases which occurred during the year in Sind, 18 were in that district. The Commissioner traces the extraordinary prevalence of this crime to susceptibility in regard to interference with women. The police succeeded in obtaining convictions in 16 of the 18 cases in Shikarpur, and in 28 of the total 38 murders committed in the province.

The general decrease of crime was chiefly conspicuous in offences against the person; offences against property showed an increase. In the preceding year improvement had chiefly occurred in the latter class of offences.

Of a gross total of 114,992 persons dealt with by the courts, 41,549 were discharged, 22,331 acquitted, and 46,485 convicted. It is noted as a satisfactory feature in the returns that, whilst there were 14,048 fewer acquittals and discharges, and 12,320 fewer persons to be dealt with altogether, there were 2,387 more convictions.

The number of juvenile offenders does not tend to increase, the total for 1875 having been 428, against 448 in 1874 and 430 in 1873. Good provision is made in this Presidency for dealing with such cases in the way of institutions where young offenders can be trained to honest trades under careful superintendence.

Measures continued to be carried on against the outlaws under Honya (referred to in the last Report, p. 7), which ended in the capture of the ringleader by the police. It also became necessary to take steps for the suppression of agrarian riots in the Poona and Ahmed-nuggur districts, further mention of which will be found on page 23.

During the year the police made 81 arrests in the city of Bombay, and 15 vagrants voluntarily appeared before the magistrates. Of this total of 96, one person was received into the Strangers' Home, the rest going to the workhouse. In the interior, 15 vagrants were brought before the magistracy, viz., 11 in Khandesh, 2 in Kurrachee, and 1 each in Surat and Kanara. Of these, 9 were sent to Bombay. The total number thus entering the workhouse in 1875 was 102 (or 13 more than in 1874), and, as 24 remained in the workhouse on 1st January 1875, the total population for the year of report was 126. Of these, 46 were discharged on obtaining employment, 5 were made over to their friends, 9 were sent to the European General Hospital, 9 to the Strangers' Home, and 5 to the Sailors' Home; 18 deserted, and 2 escaped; 6 were deported to England, and 1 was released but not removed from British India; 3 were sent to England by the Shipping Master as distressed seamen, and 2 remained in the workhouse at the close of the year. Punishment was resorted to in 29 instances, the offences being chiefly drunkenness and irregularity in returning to the workhouse from leave to look for employment. The health of the inmates was good. The total cost to Government on account of vagrants throughout the Presidency was 821*l*. Taking the nationalities and previous occupations of the 102 vagrants admitted to the workhouse in 1875, it appears that 71 were British-born subjects and 5 Europeans of other countries, 3 were Americans, and 23 Eurasians. Twenty-five had been in railway employ, 3 clerks in Government offices, and 16 clerks in private firms; there were 23 sailors,

8 soldiers, a groom, a play-actor, 2 apothecaries, 2 chemists, 8 mechanics, and the rest of various occupations.

The statistics of crime in the Punjab remained generally stationary as compared with the preceding year. The proportion of reconvictions was, amongst male prisoners 13 per cent., and female 5 per cent., while amongst juveniles the ratio was as high as 26·81 per cent. Punjab.

The number of cases reported by the police in the North-West Provinces was higher by 7,000 than in the preceding year, but the great majority of offences were of a trivial character, and the increase was more apparent than real. In serious crimes, such as rioting, culpable homicide, robbery with violence, and theft, there was a diminution. The offence of house-breaking continued very prevalent; the experiment of severe sentences was being tried in the hope of suppressing it. North-West Provinces.

The improvement in heinous crime was in great part attributed to the breaking up of several notorious dacoit gangs, and to measures taken for ensuring the safety of the public roads by the systematic patrolling of the rural police. The most famous gang of dacoits was that under Randhir Singh, who had carried on his operations for eleven years, but was at length, during the year under report, hunted down by the police and shot, while his five followers also met their deaths fighting.

In Oude there was a further decrease of crime in 1875-76. As in the former year, the improvement was most marked in cases of theft by house-breaking. Under thefts generally there was a great diminution, the low price of grain having removed a source of temptation. Murders and attempts to murder fell from 125 to 109. On the other hand, there was an increase in the cases of culpable homicide from 63 to 78. Twenty-four cases of dacoity were reported, but none of them were attended with murder. Oude.

The proportion of juvenile to adult prisoners was 1·5 per cent., being higher than in any year since 1870. Reconvictions amongst juvenile offenders were also very numerous.

The report on crime in Ajmere for 1875 was much more encouraging than that for the previous year. In the number of offences reported there was a great diminution, amounting to nearly a quarter of the whole criminal returns. For this improvement credit is given mainly to increased efficiency in police administration, and other causes mentioned are the lowness of prices, the abundant demand for labour on public works, and the responsibility entailed on headmen of villages, as well as on the thakoors, to keep order in their estates. The decrease occurred in all classes of crime, but principally under the head of thefts. There was not a single case of murder or dacoity. There was an entire absence of border crime, which was partly due to the energetic measures taken by the Marwar durbar for the suppression of such crime. Ajmere.

In the number of juvenile prisoners there was a notable decrease; those under the age of 16 years numbered 14, against 51 in 1874. All these young offenders are taught trades, and those whose term exceeds six months are also instructed in reading and writing.

There was a continued improvement in the amount of crime in the Central Provinces, again attributed to the effect of agricultural prosperity. Serious offences against person and property, and property only, decreased by 11 and 3 per cent. respectively. On the other hand, serious offences against the person only showed an increase, principally in murders and attempts to murder. Central Provinces.

In the Hyderabad Assigned Districts heinous crime continued in about the same ratio as in the preceding year. There were investigated 33 cases of murder, of which, however, only 16 were prosecuted to conviction; and 11 cases occurred of dacoity. Berar.

There was a considerable decrease in sentences of imprisonment on offenders who had once before been convicted, but in regard to those who had been more than once previously convicted there was an increase. In the number of juvenile offenders there was a marked improvement.

Crime showed an increase in Coorg as compared with the previous year, which increase was entirely due to a larger number of offences in the form of coffee stealing. Coorg.

Although, as a fact, less aggregate crime was reported in British Burma, there was a serious advance in many of its graver forms. Murders increased from 72 to 77; hurt by means of dangerous weapons from 219 to 323; and housebreaking from 518 to 697 cases. The prevalence of the latter class of crime is in a great measure due to the flimsy building materials employed by the Natives, and to carelessness in the protection of their property. British Burma.

Dacoities, which for some years back had steadily diminished in number, rose in this year from 23 to 38; there is, however, reason to believe that the rise was due to exceptional causes and abnormal. In the spring months the events connected with Sir Douglas Forsyth's mission, and the stir and peril which prevailed beyond the borders, in some degree affected our own possessions, and encouraged some obscure criminals in the Rangoon district to

attempt an organised system of pillage. There were few police in the sub-division, and these were under the supervision of a weak and timid Native magistrate, who could effect nothing against the marauders. The latter finally consummated their career of crime by murdering a policeman, badly wounding the District Superintendent, and killing Colonel Hamilton, the Inspector-General. The gang succumbed, however, to the attack. Their actions were emulated by another band of dacoits in the same district; under two leaders, who were captured towards the close of the year, whereupon the sub-division resumed its usual tranquillity. In most other parts of the province quiet and order were maintained.

There was an unsatisfactory increase both in the proportion of re-convictions and in the number of juvenile prisoners. The latter rose from 136 to 178; of the total number, 15 had once before been in prison, and 9 more than once, and 113 were wholly illiterate.

INFANTICIDE.
Bombay.

In last year's Report (p. 9) a summary was given of the history of infanticide in the States of the Bombay Presidency. The following are some statistics for the year 1875-76.

In Kattywar, taking all the Rajpoot tribes, the per-centage of females to males was 90·70, or, taking only the Jadeja tribe, 91·39. In 1872 (the latest year to which the above summary was carried down) the per-centage among the Jadeja tribe was 90·93. The death-rate among male infants in 1875-76 was 15·59 per cent. on the total number of male births, and among females 15·19 per cent.; the rates in the previous year were 18·03 and 16·02 respectively. The number of unmarried Rajpoot girls of a marriageable age was 1,545, as compared with 1,508 in the preceding year. It is clear that the practice of infanticide is not now prevalent in Kattywar. A plan for encouraging Rajpoot marriages by limiting the expenditure on a marriage to one-third of a year's income was favourably received by the classes interested.

The returns for Kutch are not so satisfactory. The per-centage of infant deaths to births among males was 18·30, and among females 31·13, against 25·47 and 30·05. Compared, however, with the previous year the results are not considered unfavourable, although there is still great room for improvement.

The per-centages in Pahlunpore were 10·52 and 12·90 respectively, against 7·69 and 26·47 in 1874-75; and in Mahce Kanta they were 16·32 and 36·66, against 6·45 and 27·45.

North-West
Provinces.

In the North-West Provinces the year 1875-76 opened with a proclaimed population of 393,529, inhabiting 3,113 villages. In the course of the year 51 villages were exempted, and one was proclaimed, so that the year closed with 3,063 villages on the list; of these, 523 were stated to be specially guilty.

The following were the respective per-centages of the births of girls and boys on the total births, as compared with those of the preceding year and with the English rate:—

—	English Rate.	North-West Provinces Rate.	
		1874-75.	1875-76.
Girls - -	49·32	47·91	47·96
Boys - -	50·68	52·09	52·04

Thus, while in the English rates there was a difference of 1·36 in favour of boys, the difference in the North-West Provinces rates for 1875-76 was 4·08 in favour of boys, showing that in the latter case concealment of female births was practised. The divergence in particular districts was considerably higher than the averages above shown.

The following is a similar comparison with regard to deaths:—

—	English Rate.	North-West Provinces Rate.	
		1874-75.	1875-76.
Girls - -	44·62	48·35	46·93
Boys - -	55·38	51·65	53·07

The English difference in favour of girls was therefore 10·76, while in the North-West Provinces it was only 6·14.

A comparison with English rates of the per-centage of deaths of each sex under one year old on the living population within that limit of age brings out very distinctly the fact that

the mortality among female infants was 4 per cent. in excess of what it should be. The figures are as follows :—

—	English Rate.	North-West Provinces Rate.	
		1874-75.	1875-76.
Girls - -	14·27	22·78	24·92
Boys - -	17·24	22·38	25·97

It is further shown that between the ages of 1 and 12 about twice as many girls died as boys, while the rate was $2\frac{1}{2}$ times greater than the English rate.

The per-centage of female infants to the total infant population in the proclaimed districts was, at the beginning of the year, 29·93,* and at its close 31·41, showing that some improvement was obtained. Progress was discerned in every district. A great difficulty which magistrates have to encounter is the evasion of the law by the removal of pregnant women to another district or to an unproclaimed village.

From a census taken for two consecutive years of Rajpoot children in 649 villages of Oude. Oude the inference is drawn that infanticide is not practised to any great extent in this province.

The rule conferring summary jurisdiction on magistrates in petty cases continued to be regarded with dissatisfaction by many among the upper and middle classes of the Natives in Bengal. The objections made, however, were only of a general character, specific complaints being but seldom adduced, and then very rarely established; while the system has resulted in the greatest possible convenience to the public as well as to judicial officers. Sir R. Temple testifies that, with a very few exceptions, the magistrates are actuated by a hearty desire to treat the Natives well. MAGIS-
TRATES.
Bengal.

In about one-third of the whole number of cases summarily disposed of Native gentlemen were associated with the salaried magistrates. The promotion of this policy will be kept in view as the best means of commanding general confidence. There were altogether 946 honorary magistrates in the province, and they were reported as showing increased zeal and interest in the work. The office also was rising in esteem.

The work done by honorary magistrates in the Punjab is stated to have been considerable, Punjab. and on the whole fairly good, and the system was greatly extended during the year.

In Ajmere the honorary magistrates rendered efficient aid in disposing of the criminal work, of the whole of which they performed 37 per cent. The arrangement is a great convenience to the parties concerned in the cases, for the residence of the majority of the magistrates in the interior of the district prevents the necessity of summoning witnesses from a distance. Ajmere.

The magistrates of the Central Provinces are reported to have shown great energy in the disposal of cases, while the small number of appeals and their result indicates that the decisions were generally sound. The weak point in their action appears to have been the excessive leniency of the punishments awarded. The large proportion borne by the number of reconvicted prisoners to the total jail population was evidence of the inadequacy of many sentences. The same complaint was made in the previous year (*see* last Report, p. 8). Central Pro-
vinces.

Honorary magistrates continued to afford great assistance in administering justice, and in the interior of districts especially proved useful. The Chief Commissioner aims at confining the distinction to persons of good social position and education, and prefers keeping the number low to making the office less prized than it now is.

Improvement was reported in the general conduct and discipline of the Bengal police. In cases of punishment there was a considerable decrease, while as many as 643 officers and men were specially rewarded for ability and courage evinced in the execution of their duties. In respect to popularity, there did not appear to be any improvement; there was a tendency to make hasty arrests and to be harsh and rough in bearing, but the authorities used every means to discourage both these faults. A great drawback lies in the status of the subordinate officers, but a remedy to this can only be applied at considerable expense. The per-centage of cases successfully prosecuted compared very unfavourably with that in other provinces; of the number of persons arrested only 59·5 per cent. were convicted. The POLICE.
Bengal.

* In the last Report this per-centage was given as 30·9; no explanation of the discrepancy is afforded in the accounts received from India.

unnecessary arrests are attributed chiefly to ignorance, and improvement can therefore only be looked for as the police become better educated, and more alive to their duties and responsibilities.

The number of men in the regular police returned as able to read and write was 8,808, besides 109 in the Government railway police, making a total of 8,917, against 8,776 in the previous year; and 2,979 besides were under instruction. While these figures show some improvement, still nearly half the entire force remained wholly uneducated.

Although not a single case of torture was proved during the year, there were several well-founded charges of extortion or bribery.

Progress was made in improving the status of the village police. Under an Act passed in 1870, magistrates are empowered to cause a proper income for the village watchman to be raised by the villagers themselves, which ensures the employment of competent men.

Madras.

The per-centage of men in the Madras police who were departmentally dismissed or punished was 28·7, against 32·4 in the preceding year. The per-centage of those who could read and write increased from 63·2 to 64·5.

Bombay.

The reports of the conduct and efficiency of the police in Bombay were very favourable; their discipline was improving, and there was a larger proportion of experienced and educated men. Of 12,189 persons whom they brought up 93 per cent. were convicted; but they had not yet generally attained a high degree of success in the detection of crime or in the recovery of stolen property. A considerable number of the men are, however, engaged on other than purely police duties, and in the Hyderabad District especially the force is said to be greatly undermanned, the consequence being that the men are overworked, and efforts to suppress crime are in a great measure defeated, while, moreover, no time is left for educational improvement. It is reported, to the credit of the railway police, that, in connexion with the Prince of Wales's visit, no less than 20 Chiefs and their suites travelled on the Baroda line to Bombay and back without the loss of a single article.

Punjab.

From the Punjab also the accounts are satisfactory. The dismissals and resignations again showed a decided decrease. It is stated that the service is now much more sought after than formerly; a better stamp of recruits is obtained, and the men are more careful not to risk losing their situations by misconduct.

So far as convictions obtained are a test of the efficiency of the force, it may be mentioned that, although the per-centage of convictions to cases reported was slightly less than in 1874, the per-centage to persons was the highest ever attained. In the recovery of stolen property, however, there was a falling off. There was much improvement in the working of the trans-Indus police.

North-West Provinces.

Among the police in the North-West Provinces there was a marked increase in the number of departmental punishments inflicted, both on officers and men. No reason for this is assigned. On the other hand, the number of those who received rewards (excluding such rewards as they could legally claim) rose from 3,914 to 4,377. A comparison with the three preceding years shows a steady advance in this respect.

Central Provinces.

The working of the force in the Central Provinces was fairly successful, and in some respects showed an advance on former years. There was a considerable decrease in departmental punishments, while 822 officers and men (out of a force of 8,513) were rewarded by promotion or money payments. Their relations with the people were generally satisfactory. The education of the force was attended to; at most head-quarter towns there is a good police school.

Berar.

The Berar police did not show much efficiency in the detection of crime. Omitting nuisance cases, the number of cognizable offences was 5,521, in only 41·3 per cent. of which conviction ensued. In the recovery of stolen property there was still less success, the ratio being 26·02 per cent., while the previous year the per-centage was 39·4. The general appearance and bearing of the men, however, were favourably reported on. There was a decided decrease in departmental punishments; in judicial punishments, however, there was some increase. The reports of the rural police or village watchmen are stated to be yearly more favourable.

On the whole, the Resident considers that police administration during late years may be regarded as successful in the repression of violent crime, and in the surveillance exercised over the criminal tribes and predatory gangs, which have well nigh ceased to be a terror, as they formerly were, to the inhabitants of the province.

British Burma.

The strength of the British Burma police was 6,756, and the steady increase in the purely indigenous element was gratifying. On the other hand the internal administration of the force showed very unfavourable results. No less than 2,053 left the service, of whom 515 were dismissed, 1,215 resigned, and 76 deserted. These frequent changes being most pre-

judicial to efficiency, the Chief Commissioner has taken measures to prevent their continuance. The magistrate will in future have full powers of direct control over the police of his district, and it is hoped that the relaxation of inter-departmental restrictions will result in better discipline and permanence.

The condition of the rural constabulary has for a long time been under the serious consideration of the Local Administration. This body consists of the village headmen, who, for almost nominal remuneration, never exceeding 10s. a year, have to exercise the most multifarious functions connected with revenue, sanitation, and police. Financial considerations have led to the postponement of a scheme for the reconstitution of the force.

While careful attention is given in Bengal to the diet and clothing of prisoners, and to the sanitary condition of the buildings, the Government aim, at the same time, at rendering the labour and discipline so rigorous as to make prison life deterrent to the criminal classes. The Lieutenant-Governor strongly supports the mark system, the efficiency and advantage of which, he says, have been fully proved, whatever may be the individual views of some magistrates on the subject. It is hoped that the grant of extra marks to convicts teaching others will serve to promote the cause of education in prisons, which appears to be in a very backward state, as, out of a daily average number of 20,462, only 1,431 were under instruction during 1875. JAILS.
Bengal.

In many of the Bengal jails the sickness and mortality were very great. The principal death causes were dysentery and diarrhoea. Many serious defects exist in the jails of the Lower Provinces, and overcrowding was a common evil. These defects were engaging the anxious consideration of the authorities, but very exceptional difficulties were involved.

The total number of deaths in all the jails of Bengal was 1,015, of which cholera occasioned 91, dysentery 360, diarrhoea 114, fever 85, pulmonary disease 146, and other diseases 219. The death-rate per cent. was 4·96, against 5·59 in 1874. The average death-rate for the five years immediately preceding 1875 was 4·94 per cent. The Behar jails were much less unhealthy than for many years past.

Of the male convicts in Madras 80·21 per cent. were agriculturists and labourers. The proportion of prisoners who could read and write well was 7·42 per cent., while 82·36 per cent. were entirely ignorant. Madras.

The system of marks for earning remissions of sentence having been found successful in the central jails, it was, towards the end of the year, extended to the district jails. It is applicable to all whose sentences are of 18 months and upwards. From amongst those who earn a certain number of marks are selected the convict servants, who are, to a great extent, employed in the direction of labour and maintenance of discipline. Besides affording an incentive to good conduct, this system has resulted in economy and increased efficiency in the details of jail management. There has not yet been time to judge of its permanent effects in forming habits of industry.

It was in contemplation to establish a reformatory for juvenile offenders in the vicinity of Madras.

The health of prisoners in Madras generally was good; but the death-rate was 3·90 per cent., as compared with 2·68 in the preceding year. The increased mortality was chiefly due to cholera, of which there were 82 cases, with 40 deaths.

As had been the case in former years, more than half the whole number of deaths occurred during the first year of prison life.

Discipline in the Bombay prisons was better maintained; although the ratio of punishments was higher, the increase was due to greater strictness. Education is optional, except in the case of juveniles. The results of prison instruction during the year were not worthy of note. Bombay.

The accommodation was considerably increased; additions were made to the Yerrowda and Tanna jails. In Guzerat alone there was still a deficiency, and there it was proposed to construct a central jail. No sickness was traced to overcrowding. A decrease in the number of admissions into hospital was accompanied with a marked rise in the death-rate from 2·3 to 3·3 per cent. of average strength; in the Presidency proper the rate was only 2·2, while in Sind it was 6·8. The state of health in the prisons is, however, considered to have corresponded generally with that of the free population. The jails in the city of Bombay are exceptionally healthy.

Owing to want of funds, it was not possible to do much in the provision of increased accommodation in the jails of the Punjab; and, on the other hand, very much damage was caused to jail buildings by the heavy floods of the year. The large jail at Umritsur was quite destroyed. Among the works which were carried out, a juvenile ward was added to the Rawalpindiee prison. Punjab.

Notwithstanding the general unhealthiness of the year, the average death-rate in prisons was only 3·19 per cent. of daily strength, which was a lower rate than that of the previous year, and far lower than that among the free population. Although, however, the mortality was less, there was more sickness than in the preceding year. This was caused principally by intermittent fever. The most fatal diseases were bowel complaints and remittent and continued fevers.

Of 19,985 persons imprisoned during the year, 96·7 per cent. were quite illiterate, and only 0·6 per cent. were able to read and write well. Of 19,973 released in the course of the same period, 81 per cent. came under the former class, and 3·1 per cent. under the latter.

North-West
Provinces.

Attention was directed in the North-West Provinces to the system under which prisoners earn remissions of sentence by good behaviour. Of those who might have earned such remissions, 15,695 in number, only 598 actually did earn them. This the Inspector-General of Prisons considered a very small per-centage of interference with judicial sentences, while the disadvantage of any such interference was far more than compensated for by the good results on the discipline of the jails arising from the action of the rules. The Local Government, while accepting this opinion with satisfaction, urged the importance of the rules being worked with great caution, as any wholesale interference with sentences would be so great an evil that it could not be balanced by any secondary advantages in the way of jail discipline. A criminal might have sense enough to behave well in jail, but this would be no guarantee that he would not begin again to prey on society immediately on his release.

The question of establishing reformatories for juvenile offenders has been under consideration. Heretofore the latter have been, as far as possible, kept by themselves and instructed in the common jails, but the conditions which surrounded them were never of a satisfactory nature.

The year was, on the whole, marked by a considerable improvement in the health of prisoners in the North-West Provinces, and that notwithstanding the prevalence of cholera in the country, and the overcrowded state of many of the buildings. The average death-rate was 2·7 per cent. of strength.

Oude.

Of the persons imprisoned during the year in Oude, 97 per cent. were unable to read and write, being the same proportion as in former years.

The new system of educating prisoners, referred to in the last Report (p. 13), came into force in 1875-76, but very little could be done for want of teachers. In August a normal school for warders was established, and another for prisoners who may be eligible as teachers.

All the juveniles in the Central Prison were taught for three hours daily throughout the year, and their progress is reported to have been satisfactory.

The condition of health in the prisons of Oude was even more favourable than it had been in 1874, the death-rate being only 1·4 per cent. of the average jail population. Although cholera was epidemic throughout the province, the jails enjoyed a remarkable immunity from the disease.

Ajmere.

The number of prisoners under instruction in Ajmere showed a very considerable increase as compared with the previous year. The educational work having been placed under the superintendence of the Inspector of Schools, system and method were introduced. An efficient teacher and an assistant teacher were appointed, and the course of study was conformed to that laid down by Government for the district schools.

The sanitary condition of the prison was, as usual, good. The buildings were thoroughly ventilated, and there was no overcrowding. The dry-earth system was in use, and answered well.

Central Pro-
vinces.

In the Central Provinces the prisoners generally were quiet and well-behaved, except in attempting to shirk work and to enjoy forbidden luxuries. The great majority of the prisoners were totally unable to read or write, and, owing to the shortness of sentences, there was very little opportunity for imparting education during the period of incarceration. From the same cause imprisonment could not be expected to exert much reformatory influence, while good-conduct rules, and the hope of earning remissions of sentence, could only be extended to a very small proportion of the convicts. Juvenile delinquents were in the central jails kept apart from the adults, and were taught for a considerable part of each day, but in the smaller prisons separation was not always possible.

The health of the prisoners was on the whole good; there were rather fewer deaths than in the preceding year.

Berar.

The conservancy of the jails in Berar was carefully attended to; and the clothing and food were good and sufficient. The number of deaths in all the jails was 21, being 27 less than

in the year before. Notwithstanding the severe cholera epidemic in the Assigned Districts, the disease only entered one out of six prisons, namely, that at Akola, in which there were five fatal cases.

Education, in the case of the older convicts, is stated to be a mere form. The juveniles attended school for four hours daily, and were reported to be making good progress.

Owing to the jails of British Burma not having been built with reference to the population of the various districts, some of them are apt to be overcrowded, while a very large amount of transfers is rendered necessary. British
Burma.

The increasing number of re-convictions apparently points to some defect in the deterrent influences of prison life. It has been decided steadily to diminish the amount of extramural labour, which, although profitable, is found to be generally inoperative, being far from distasteful to the prisoners, while it affords frequent opportunities for escape and other abuses. Arrangements were also being made in central jails for the separate confinement of habitual criminals.

In the middle of the year a widespread organised plot to break out of the Rangoon jail was discovered through the agency of an informer. The inquiry which followed disclosed grave laxity on the part of the jail officers in the selection of prison officials, and in other respects. The Chief Commissioner immediately passed an order requiring all the higher grades of jail officers to pass a colloquial examination in the vernacular within a year of appointment, it being previously possible for convicts to arrange the details of an outbreak within the hearing of a jailor without being understood.

Among 8,292 prisoners admitted during the year, 54·87 per cent. were entirely illiterate, and 14·71 per cent. only were able to read and write well.

In the Calcutta High Court the work of the original side continued steadily to increase. On the appellate side 6,815 appeals and applications were disposed of, against 7,453 in 1874. CIVIL JUSTICE.
Bengal.

The number of suits instituted in the Calcutta Court of Small Causes was smaller than during any of the three previous years, owing, apparently, to the interruption of business by the visit of the Prince of Wales. There was, notwithstanding, a decided increase in the total value of suits, indicating greater confidence on the part of the public in the judgments of the court.

With regard to courts in the interior, it was noticed in the last Report that the steady increase of business for some years past received a check in 1874. The causes of this depression having been removed, litigation resumed its ordinary course, and in 1875 the number of suits instituted exceeded that in 1874 by 43,960.

There was an increase of 8·6 per cent. in the number of registrations effected during the year. As yet but little recourse is had to registration which is not compulsory, its advantages not being appreciated sufficiently to outweigh the expense and inconvenience connected with it. Instructions have been given with a view to prevent delays in the transaction of business, and to afford every facility to the public.

In the Madras High Court 541 suits were instituted, as compared with 817 in 1874. The number was less than in any year since 1866. The falling off was probably in some degree due to the raising of the table of fees since August 1874, although this measure did not so far affect the business at all to the extent that was expected. Madras.

The number of suits instituted in civil courts subordinate to the High Court was 207,393, showing a decrease of 8,144, of which 7,379 were small causes. During a portion of the year most of the Small Cause Courts were closed, the question of their abolition being under the consideration of Government. In the other courts business was interfered with by the prevalence of cholera, and also by the Prince of Wales's visit.

The aggregate value of the property involved in the suits disposed of during the year was much less than in either of the two preceding years. The proportion of contested suits to uncontested was nearly 2 per cent. higher than in those years.

The objects aimed at by the system of registering documents are being successfully attained in the Madras Presidency. The number of registrations effected during 1875-76 exceeded that of the previous year by 11·5 per cent., and was the highest on record. The total value of the property concerned was 8,741,577½. The proportion of optional registrations was also increasing; in 1875-76 there were 82,832 deeds so registered, against 154,430 the registration of which was compulsory.

Civil litigation in the Bombay Presidency increased in comparison with 1874, but, omitting that year, when it was at an exceptionally low ebb, there was a smaller number of cases than there had been for several years past. There was a net increase of 6,570 suits instituted in the subordinate judges' courts, but this increase was confined to Sind, where it was occasioned by the disastrous effects of excessive floods. Of the total suits, 91 per cent. were for Bombay.

money, and of these 98 per cent. were for sums of 50% and under. The average duration of contested suits was 205, and of uncontested 162 days, against 128 and 126 respectively in 1874. The reason of this increase appears to be that the cultivators, who have long been the victims of extortion by the money-lenders, being restrained from using violence against their oppressors, now adopt the plan of denying their bonds and hotly contesting suits brought against them. The diminution in the number of suits is attributed, in great measure, to the creditors being less inclined to lend, owing to the difficulty they find in recovering their claims. Applications to execute decrees continued to be very numerous. It is satisfactory to find that imprisonment was less resorted to; attachments and sales of moveable property also very considerably diminished. On the other hand, attachments and sales of immoveable property were only slightly fewer than in 1874, from which it is inferred that the ryots had little left to part with except their interest in the land.

Registration of documents, which in the previous year had shown a very great decline, slightly revived in 1875-76. The increase was largest in Sind, for causes connected with the floods.

Punjab.

The steady increase of litigation in the Punjab since the year 1870 received a slight check in 1875, owing, it is believed, to exceptional causes, namely, the extremely unhealthy season, which for some time virtually closed the civil courts in some districts, and the damage caused by the floods and excessive rainfall, which occupied the attention of the people and absorbed their savings. The increase will, in the opinion of the Local Administration, continue in future years proportionally to the increase of population and the prosperity of the country. It is considered that this free resort to the Law Courts for the settlement of cases which would have been settled in old times by violence or not at all is not an unfavourable sign, but that it rather means an increasing confidence of the people in the integrity of the courts, and an advance of prosperity. Compared with the judicial statistics of England, the amount of litigation in the Punjab is not excessive.

Of the total number of cases, 36 per cent. were contested; and of the latter, 71 per cent. were decided in favour of the plaintiff. The average duration of contested cases was 23, and of uncontested 17 days. More than half the litigation was for sums not exceeding 1%, and about one-sixth for sums of less than 10s.

For the first time since the formation of a regular department of registration in this province there was an increase instead of a decrease in the number of documents registered; and this increase occurred in optional as well as in compulsory registration.

North-West
Provinces.

The civil courts of the North-West Provinces are of two classes, those immediately subordinate to the High Court, and those under the direct control of the Government; the latter being those comprised in the districts of Kumaon, Gurhwal, and Tehree. In the former class the number of suits in 1875 was 98,422, being 1,558 in excess of that of the previous year. In some districts litigation increased, and in others it diminished. The contested cases were 38 per cent. of the total disposed of. In the latter class of courts there was a decrease of litigation, which is explained partly by the prevalence of sickness in Gurhwal, and partly by the temporary nature of the causes of the increase in 1874.

Oude.

The total number of suits instituted in Oude during 1875 was 67,928. This was 2 per cent. higher than the number in 1874, the increase being chiefly in rent suits. There was an increase of 27 per cent. in the value of the suits disposed of, while the cost increased by 11 per cent. only. The proportion of contested cases was slightly higher. The average duration of contested cases was six days less than in the previous year, and of uncontested, one day less.

Ajmere.

In Ajmere the amount of civil litigation continued to be remarkably large, but this feature is stated to have co-existed during the last few years with a marked degree of general prosperity. The suits were mostly on bonds for money due, and their average value showed a material decrease. Only 27.88 per cent. of the cases were contested, and in only 367 out of 1,846 contested cases was judgment given for the defendant. The admission of the execution of a bond is legally regarded as sufficient ground for passing a decree, without any respect being had to the circumstances under which the bond was executed; and the bonds are generally composed by the creditor in a language foreign to the debtor, and merely signed or marked by the latter. This condition of things appears to require some remedy.

Central Pro-
vinces.

In the Central Provinces the number of civil suits (78,088) was higher than in any previous year, but their value was small, and they were ordinarily of a very simple nature; 84 per cent. of the whole were for money due on a bond or other contract.

The average duration of suits showed improved action on the part of the Judges, being, in the case of contested suits, 24.3 days, and of uncontested, 16.3 days. Of all suits disposed of 73.3 per cent. were uncontested.

The fact of the large number of unexecuted decrees, which was commented on last year (*see* Report, p. 14), was again apparent in the statistics of 1875. The Chief Commissioner infers that a decree is by many suitors sought as an investment, not as a means of obtaining the satisfaction of a claim.

There was a decrease of civil suits in every district of Berar but one, a fact which was probably due to the cholera epidemic. The average value of the suits was a little under 10%. The per-centage of contested cases showed a falling off, particularly in one district, where a court presided over by a Native Judge disposed of no less than 3,854 suits, of which only 16 per cent. were contested. The average duration of contested suits was 66 days, showing a want of promptitude generally in the disposal of cases. Berar.

The sale of land in Berar in execution of civil decrees requires the sanction of the Commissioner in the case of self-acquired property, and of the Resident in the case of ancestral lands. The effect of this wholesome provision is apparent from the fact that, out of 214 cases in which sales were recommended by the Civil Courts, in only 138 instances were the sales actually effected.

Civil litigation is stated to be year by year expanding in British Burma; 31,998 suits were instituted in 1875 against 29,935 in 1874. Part of the excess was due to the formation of the Thonkwa district, and the consequent augmentation and increased accessibility of the courts in that part of the country. The increase of work was not accompanied with additional delay, contested cases having on an average only occupied 10·9 and uncontested 5·8 days. The Chief Commissioner thinks that a further diminution in this respect would be hardly desirable. British Burma.

The Burmese judges, while their standard of legal attainment is but low, resort in a great degree to national code and custom, and their administration of justice appears from the results to be very popular. Of their decrees only 11 per cent. were appealed against, and 4 per cent. reversed.

III.

FINANCE.

REVENUE
AND EXPEN-
DITURE.

The following is a statement of the Ordinary Revenue and Expenditure in India and England, compared with the three preceding years:—

	1872-73.	1873-74.	1874-75.	1875-76.
Revenue	£ 50,219,489	£ 49,598,253	£ 50,570,171	£ 51,310,063
Expenditure	46,343,316	49,968,569	49,006,412	48,665,808
Guaranteed Interest, less net traffic receipts	2,110,501	1,437,352	1,244,562	975,310
	48,453,817	51,405,921	50,250,974	49,641,118
Surplus	1,765,672	—	319,197	1,668,945
Deficit	—	1,807,668	—	—

The principal heads of Revenue are shown in the following summary:—

	Land Revenue, including Fisheries.	Opium.	Salt.	Excise.	Customs.	Stamps.
India (general and political)	£ 68,678	£ —	£ 93,019	£ 18,137	£ —	£ 23,550
Madras	4,545,013	—	1,353,789	633,901	307,962	501,971
Bombay	3,690,354	2,549,497	880,441	397,528	715,691	466,986
Bengal	3,776,506	5,921,928	2,561,553	608,818	1,076,364	935,019
Punjab	2,001,117	—	790,518	95,478	92,667	247,293
North-West Provinces	4,245,745	—	528,510	223,614	39,204	354,179
Oude	1,407,431	—	1,487	79,102	20,759	94,042
Assam	337,358	—	—	141,456	—	51,572
Central Provinces	607,885	—	19,066	135,639	10,151	97,261
British Burma	823,655	—	16,032	159,559	458,591	63,495
Total	21,503,742	8,471,425	6,244,415	2,493,232	2,721,389	2,835,368

The chief items under Ordinary Expenditure were as follow:—

	£
Payments in realization of revenue, refunds, &c.	9,483,279
Army	15,308,460
Interest on debt	5,178,108
Public works, including supervision and cost of land for guaranteed railways	2,907,795
State railways	214,713
Loss by exchange on transactions with London	1,429,658
Famine relief	508,554
Allotments for provincial services	5,153,652
Administration	1,697,365
Law and justice	2,336,477
Superannuation allowances, &c.	1,939,305

The Extraordinary Expenditure included—Irrigation 1,105,445*l.*, and State Railways 3,165,184*l.*

OPIUM AND
EXCISE.
Bengal.

The number of chests of Bengal opium sold during 1875-76 was 45,510, against 45,000 in 1874-75; the price realised per chest was Rs. 1,259.2.11, against Rs. 1,207.0.4; and the net revenue amounted to 3,705,170*l.*, against 3,264,266*l.*

The consumption of opium within the province remained stationary, but in the revenue there was an increase of 1,916*l.* A beneficial check on consumption is shown to result from the raising of the selling price. In Balasore the quantity consumed diminished from 129 to 122 maunds, while the revenue increased from 9,579*l.* to 10,030*l.*

In the preceding year there had been a great falling off in the excise revenue, owing to the

scarcity in Northern Bengal and Behar, but the prosperous season of 1875-76 entirely compensated for the temporary loss. The revenue of the latter year amounted to 608,818 $\frac{1}{2}$., largely exceeding that of any previous year. The increase was principally under the heads of country spirits, rum, and ganja. This improvement of revenue was concurrent with a maintenance of the principles which were expounded at length in the Report of last year (p. 17). It was obtained, not by the multiplication of facilities for obtaining liquor and drugs, but partly by increased consumption following on the prosperous condition of the people, and partly by the issue of licenses at higher rates and the raising of the prices of opium. The number of licenses for the sale of country spirits was reduced from 5,173 to 4,426; those for ganja from 4,394 to 3,340; and licenses of other kinds were likewise diminished in number.

The consumption of ganja decreased throughout Orissa, where a growing taste for it had been noticed during the last few years. The alleged prevalence of intemperance among the Sonthals occupied the attention of the Government, and the licenses for the sale of country spirits in the Sonthal Pergunnahs were reduced from 409 to 221, while the actual consumption diminished from 99,666 to 67,381 gallons.

An increase appeared in the consumption of spirits manufactured in India by the English method, which was probably due to the raising of the duty on imported spirits by the Tariff Act of 1875. The Lieutenant-Governor observes that, in his decided opinion, the administration of the Excise Department rests upon a secure and satisfactory basis; the revenue is large, and is collected punctually and at a very small cost; and the department is conducted in accordance with the principles of morality which have been laid down by Government for the guidance of its officers.

The imports of beer and spirits were much smaller than in the preceding year, but there was a slightly increased import of wines, and, owing to the increase of the tariff rates, the customs revenue derived from liquors improved from 122,351 $\frac{1}{2}$ l. to 128,154 $\frac{1}{2}$ l.

The Bombay opium revenue, which in the preceding year had been abnormally high, was less in the year under report by about 400,000 $\frac{1}{2}$ l.; the pass fees realised 2,549,435 $\frac{1}{2}$ l., besides 62 $\frac{1}{2}$ l. for confiscations and miscellaneous receipts. The exports were, however, close upon the average of the four previous years. The China market was very much depressed. The exportations to that country and other places were as follow:—

Bombay.

China	-	-	-	-	41,517 chests.
London	-	-	-	-	30 "
Liverpool	-	-	-	-	30 "
Zanzibar	-	-	-	-	7 "
Mauritius	-	-	-	-	2 "

The amount derived from fees for selling opium within the Presidency was 14,709 $\frac{1}{2}$ l. This was an improvement on 1874-75, which was due to the substitution, in certain parts, of the practice of selling through licensed vendors for the system formerly prevailing of selling departmentally. Until 1875-76, there had been for some years a steady decline in the receipts from the inland traffic.

The revenue was again collected without default, and at a cost of less than $\frac{1}{4}$ per cent.

There was an increase in the excise revenue from spirits. The question of raising as much as possible the duty on country spirits, in consequence of the enhancement by the Tariff Act of the duty on spirits imported from abroad, was engaging the attention of the Government.

The system adopted in the Central Provinces (*see* last Report, p. 18) of supplying Government opium to licensed vendors, which was previously in force throughout the Chutteesgurh Division, was extended during this year to the whole of the Nagpore Division, and to the district of Seonee. The experience of the year justified the conclusion already arrived at that the system is a financial success.

Central Provinces.

There was a further increase in the excise revenue on spirits, which was the result partly of better administration, but partly also of the continued prosperity of the people.

The receipts from salt in Bengal showed a very considerable falling off as compared with those of the preceding year, namely, from 2,671,768 $\frac{1}{2}$ l. to 2,550,190 $\frac{1}{2}$ l. The bulk of the decrease (106,468 $\frac{1}{2}$ l.) was in the amount realised as customs duty. In the actual importations there was a large increase; the amount imported into Calcutta was the largest on record. But the quantity cleared for consumption was less than in the previous year, owing, it is stated, to the reduction of duty on salt from Bombay. A quantity sufficient for more than six months' consumption for the whole of Bengal remained in stock at the close of the year.

SALT.
Bengal.

There was also a reduction of 16,000 $\frac{1}{2}$ l. under excise duty. The decrease of manufacture occurred entirely in Pooree, and was attributed to heavy rains, large stocks in hand, and discouragement caused by the invasion of Ganjam salt. The imports from Ganjam, as compared with the two preceding years, rose from 1,419 and 11,638 to 114,338 maunds.

The anticipations referred to in the last Report (p. 19) that the Pooree manufacture is tending towards extinction are thus further confirmed. This circumstance does not, however, affect the Imperial revenue, which indeed is benefited by the enhanced duty on Ganjam salt; the only sufferers are the Pooree manufacturers, for whose relief measures were still under consideration.

The consumption of salt in Bengal appeared to be considerably above the rate of 10 lbs. per head; and there was no insufficiency anywhere except in the districts of Behar, where the population is impoverished, and illicit manufacture is carried on.

Madras.

The net revenue realised from salt in Madras was 1,166,752*l.*, or 20,481*l.* more than in the previous year. The causes of the increase were the enhancement of price in certain districts, the demand in the Central Provinces owing to the abolition of the Inland Customs line, and the facilities afforded to the manufacture and sale by the absence of rains, the extension of the South Indian Railway, and the prohibition of the use of earth-salt. Prior to 1875 the Government selling price for salt throughout the Presidency was fixed at Rs. 2 per maund, but an Act passed by the Government of India in the commencement of that year authorised the Local Government to settle the price from time to time in the several districts at such a rate as shall suffice to cover the duty, which under the old system had been found to fall unequally in different parts of the Presidency.

The question was under consideration during the year of abolishing the Government monopoly in salt, and substituting a system of excise similar to that prevailing in Bengal and Bombay. A Commission was appointed to investigate the subject.

Another question raised in connexion with salt was the apparent pressure of the duty on the fish-curing industry, and the consequent use by the people of insufficiently cured fish. The industry appeared moreover to be a rising one, and, with a view to encourage its development, it was determined to set apart certain yards within which the necessary amount of salt should be supplied at about cost price. The extension of this system will depend on the success of the experiment.

Bombay.

All opposition to the Bombay Salt Act (described in last year's Report, p. 19) is stated to have been overcome. The arrangements for licensing owners of salt works, for bagging salt, and for the examination of consignments at floating preventive barges, worked with smoothness and success. These reforms have provided an effective check against the fraudulent removal of salt from the works.

There was a considerable increase in the net salt revenue, namely, from 747,203*l.* to 824,339*l.* This was in great measure due to the new Salt Act, and to the system of compulsory prepayment of duty on exportations to Bengal and Madras, which had been brought into force in the middle of the preceding year. Excluding from the comparison certain items affected

	£	by the recent measures of Government, the figures shown in
*1871-72	- 635,386	the margin * are considered to set forth a correct view of the
1872-73	- 682,010	progressive increase of the gross collections during recent
1873-74	- 729,814	years; and the increase for the year under report over that
1874-75	- 715,101	preceding it is thus estimated at 50,628 <i>l.</i> The result appears
1875-76	- 765,729	to confirm the wisdom of the measures referred to, which

also contributed to the increase of consumption within the Presidency. The latter averaged 11.3 lbs. per head, against 10.4 lbs. in 1873-74, and 9.7 lbs. in 1872-73.

The prepayment system caused much less disturbance to trade than had been anticipated. It did not by any means, as had been feared, destroy the Calcutta trade, which, it is believed, will in a year or two return to its former dimensions.

The quantity of salt manufactured during the year fell short of the produce of 1874-75 by 2,790,325 maunds. The cause of this was the strike among the Konkan manufacturers in connexion with the new Act. Since the year under review manufacture is reported to have again steadily progressed; stocks were abundant, and prices very low.

In quality the salt made in 1875-76 is stated to have been superior to any previous crop, owing, in some measure, to the emulation excited by the offer of rewards by Government.

Mention was made last year of the serious falling off in exports of Baragara salt to Malwa, owing to its being unable to compete with the untaxed Rajpootana salt. In view of enabling it to compete on favourable terms with the latter, the Government of India accorded their sanction, shortly before the close of the year, to a proposal to supply this salt to Holkar at Rs. 2.4.0 per maund, to be delivered at the terminus of the Indore State Railway. The remission of duty amounts to Rs. 0.14.1 per maund.

Central Provinces.

The experience in the Central Provinces of the year ending May 1876 in regard to the effect of the abolition of the Inland Customs line (*see* last Report, p. 20) was altogether satisfactory. The duty paid at the salt pans in Madras on the increased importation into

Chutteesgurrh of 79,060 maunds of eastern salt exceeded the amount of the revenue renounced at the Customs line, besides which the saving of establishments was considerable; the gain in a political sense was very great, and the economical advantage to the people was shown in the increased sales throughout the province.

The total actual salt revenue showed some falling off, owing to reduced importations of duty-paid salt from the western coast.

There remained at the end of 1875-76 only four districts (Cooch Behar, Chittagong Hill Tracts, Sonthal Pergunnahs, and Singbhoom) to which the Bengal Road Cess Act was not extended. For the year ending 30th September 1875 the demand on account of the cess on lands and mines was 93,051 $\frac{1}{2}$ %, and on houses 6,708%, making a total of 99,759%. The collections under the first head (including arrears) amounted to 90·81 per cent.; under the second head they were not so satisfactory, reaching only about 69·3 per cent., which was attributed to the variations arising from the poverty, death, or evasion of the householders.*

BENGAL
ROAD CESS.

As an adjunct to the provincial finance the Lieutenant-Governor is of opinion that the importance of this tax (of which the yield is expected to amount to 300,000% a year) can hardly be overrated; and it is apparently paid without a murmur.

The London price of bar silver per ounce standard was about 57 $\frac{1}{2}$ d. at the beginning of the year under review, but at its close was as low as 52 $\frac{1}{2}$ d. As a further decline seemed probable, and our Indian interests were threatened to an alarming extent, a Select Committee was appointed by the House of Commons on the 3rd March to "consider and report upon the causes of the depreciation of the price of silver, and the effect of such depreciation upon the exchange between India and England." The result of the Committee's investigations, together with the further fall and subsequent improvement of the silver market, will be treated in the next Report. Meanwhile it may be mentioned that Sir R. Temple, writing in 1876, observed that, while the fall injuriously affected the Government, and many servants of Government and others living on fixed incomes, and while it caused those general feelings of uneasiness which always arise in connexion with apprehended retrenchments, it yet left many great interests quite uninjured, and to some it actually produced advantage. The export trade, on the whole, was benefited; prices in the interior did not rise; the landed interests were not affected; and the Natives generally suffered neither loss nor harm. The rise in the value of produce from this cause must, however, he adds, be only a question of time; the higher prices paid in Calcutta must soon influence those paid in the interior at the large marts, and ultimately even the petty transactions between the local dealers and the cultivators themselves.

DEPRECIATION OF
SILVER.

* In the last clause under this head in last year's Report (p. 21)—
For 1874-75 read 1873-74 (*i.e.*, year ending September 1874).

£	£
For 74,213	read 80,459 (demand).
„ 57,635	„ 60,749 (collections).
„ 8,918	„ 10,715 (remissions).

IV.

LAND ADMINISTRATION.

GREAT TRI-
GONOMETRI-
CAL SURVEY.

The great triangulation of India, the basis on which rests the entire fabric of the surveys of the country, is steadily approaching completion. During the year under review two series were brought to a conclusion,—the Jodhpur Meridional Series and the Ceylon Connecting Series,—by means of which complete unity will be introduced between the India and Ceylon Surveys. The topographical operations of the Department were carried on in Dehra Doon, in Kattywar, and in Guzerat.

TOPOGRA-
PHICAL SUR-
VEYS.

The year 1875-76 saw the commencement of a survey of the province of Mysore, our geographical knowledge of which had previously been based on a rude survey made in the early part of the century. The cost of this survey is borne by the revenues of Mysore.

The Topographical Surveys have in the course of the last 16 or 20 years progressed so much that the areas now remaining for survey comprise for the most part thinly inhabited and non-revenue yielding tracts. The completion of a first survey of all India is not very distant. But there is still much to do in the way of revision, especially in that portion of the Atlas sheets embracing part of the Bombay and Madras Presidencies, which was based on old and inaccurate surveys. Measures have already been adopted by the Madras Government for the utilisation and reduction for the Atlas of India of the labours of the Madras Revenue Survey.

The North-West Provinces also require to be re-surveyed on accurate principles.

Compared with those of 1874-75, the results of 1875-76 show a small decrease, due partly to the reduction of establishments ordered by the Government, and partly to the hostile attitude of the Nagas, whose treacherous murder of Captain Butler, the Political Agent, in the early part of the season, necessitated a premature retreat of the surveying party.

REVENUE
SURVEYS.
Government
of India.

The Revenue Survey operations under the Government of India were carried on by 17 different parties. Two of these were engaged in the Dehra Ismail Khan and Rohtak districts of the Punjab, four (on cadastral surveys) in the North-West Provinces, six in the Lower Provinces, two in the Nassick, Ahmednuggur, Poona, and adjacent districts of the Deccan, one in Assam, and one on a demarcation of the frontier line between Oude and Nepal. The total outturn of work amounted to 11,175 square miles on the several scales of 2, 4, 16, and 32 inches to the mile. The cost of the cadastral survey averaged 5 as. 1 pie per acre.

Efforts have been made by the officers in charge of the Deccan Surveys to utilise the Bombay Settlement maps as far as possible for incorporation in the Topographical Survey sheets, but the result so far has not been very satisfactory.

Madras.

Revenue Survey operations were carried on in several districts of the Madras Presidency. The outturn of work compared favourably with that of previous years, notwithstanding the general unhealthiness of the districts in which the parties were engaged.

Bombay.

The operations of the Revenue Survey Department in Bombay amounted to 1,843,782 acres surveyed, and 1,552,219 acres classed. Besides the increase of revenue, a most important consequence of this work is the definition of tenures and rights. Already good work has been done in this direction, and eventually an amount of evidence will be collected which will be invaluable to the courts.

Punjab.

In the Punjab, besides 3,740 square miles of boundary survey prepared in advance, and 538 linear miles of levelling, the total return of area completely surveyed during the year was 2,861 square miles. One party was employed in the frontier districts of Dera Ismail Khan and Bannu, and completed 1,951 square miles; and in the Gurgaon and Rohtak districts the area so surveyed was 910 square miles.

Berar.

The establishment in Berar classed during the year 609,098 acres, being an increase of 18,869 over the work done in the preceding year. In the case of 1,561 fields submitted to test the discrepancies brought to light were all very trifling. Taking into consideration the varieties of soil in the Woon taluka, this result is regarded as extremely satisfactory.

Coorg.

The Survey Department in Coorg was engaged during the year in the preparation of the topographical map of the province, and in surveying and demarcating State forests and such

portions of waste land as had been applied for. The quantity of work performed was largely increased at a considerably reduced cost.

There were 618 settlements effected in Bengal during the year, of which only 10 were original, the remainder consisting of summary settlements and re-settlements. The increase of revenue secured was 3,305%. The settlement of the Sonthal Pergunnahs, though unavoidably summary, conferred a substantial benefit on the agricultural community, so that all classes were disposed to accept it without opposition. LAND REVENUE.
Bengal.

The demand for the year on account of land revenue was 3,455,593% ; arrears being added, the amount was 3,860,877%. Of this the collections amounted to 95.58 per cent.

The net demand on land held by ryots in the Madras Presidency was 4,649,028%. The collections on land of all descriptions amounted to 4,539,657%, being 92,405% less than the collections of the previous year. Extensive remissions were granted in consequence of a very unfavourable season. Madras.

In Bombay the land revenue for collection on account of the year ending 31st July 1876 was returned at 2,734,707%, and the amount collected (including outstanding balances) was 2,731,838%. No returns were received from Nassick and Rutnagherry. Remissions in the the Poona and Sholapore Collectrates amounted to 18,897%, being a reduction of about 15 per cent. Prices there showed a decided upward tendency during the year. Bombay.

The revenue was collected with even less pressure than in 1874-75, and that notwithstanding the unfavourable season. The number of distrains was less by 1,000 than in the previous year.

The revised settlements resulted in the assessment of 23,635% in excess of past collections. The enhancement amounted to 51 per cent. in 138 villages of the Dharwar Collectorate, to 45 per cent. in part of the Nassick taluka, where the Great Indian Peninsula Railway has brought an accession of wealth, and of 34 and 27 per cent. in other districts.

The unfavourable season and heavy floods in the Punjab had their effect on the collections of land revenue, which amounted to 1,897,057%, being 98.7 per cent. of the demand, against 99.1 per cent. in the preceding year. This amount is exclusive of 4,145% collected on account of outstanding balances. The enhanced assessments in the Hazara and Dera Ghazee Khan districts, which had been in force for nearly three years, continued to be collected with great ease. Punjab.

The net increase of assessment for the year 1875-76 due solely to revisions of settlement was 42,276%, which was nearly equal to the net receipts from the same cause from the commencement of the revisions up to the close of 1874-75, the amount of which was 47,673%. "In fact," the Lieutenant-Governor observes, "the recent settlements may now be said to be turning the scale, and making settlement operations, which involved at first a considerable loss to Government, profitable."

The collections in the North-West Provinces for the revenue year ending 30th September 1875 amounted to 4,185,231%, against 4,165,494% in 1873-74. The result of the assessments declared during the year was an increase to the revenue of 21,138%. North-West
Provinces.

A new system of village records was introduced tentatively in some lately re-settled districts, and, having been found to work well, was to be extended to all districts under temporary settlement. By this system village accountants are required to make tours of villages under their charge when crops are on the ground, and note in writing the circumstances of tenure, rent, and agriculture. The chief aim of the system is to keep up accurate statements, so as to avoid the recurrence of extensive and costly revisions of records; and it will at the same time provide for the agriculturists more trustworthy registers of their rights, and for the Government a valuable collection of agricultural statistics.

The current demand for land revenue in Oude was 1,412,455%, of which 1,339,314% was collected, 50,410% remained outstanding, and the remainder was either remitted or refunded. Of the arrears outstanding at the commencement of the year (128,165%), 54,730% was collected, and 6,649% remitted. Oude.

The summary assessment of the Gonda district was enhanced 56 per cent. by the revision which was completed during the year.

The land revenue collections in the Central Provinces for the year ending September 1875 amounted to 612,935%, and the outstanding balances were small. Although in some districts money was scarce, no difficulty was experienced in collecting the revenue. Central Pro-
vinces.

In the Assigned Districts the demand amounted to 636,572%. The improvement in the revenue was due, not to increased assessment, but to more correct measurement, and also to the encouragement which cultivation received from a settlement on favourable terms. The effect of the new settlement in the Yeotmal taluka was an advance in the revenue from 9,972% to 12,759%. Berar.

British
Burma.

The land revenue demand in British Burma was 445,055*l.* against 440,704*l.* in 1874-75.

A larger area of land was brought under cultivation during the year, but the large amount of remissions due to devastating floods in the Irrawaddy delta reduced the actual revenue by 1.60 per cent. as compared with the net realizations of the preceding year.

LAND
TENURE.
Bengal.

There was no recurrence during the year of agrarian disturbances in Bengal, but opinions differed as to whether the quarrels had been really composed. To many it appeared probable that questions were at issue between landlords and tenants which must sooner or later break out into serious dissension; in fact, since the close of the official year an outbreak of this nature did occur at Furreedpore. With a view to prevent such disturbances, an Act was passed enabling the Government to empower the land revenue officers summarily to decide any serious rent disputes, and there will in consequence be no difficulty in taking prompt and effective action in any such cases in the future.

Another important measure was in progress, but was not finally sanctioned during the year under review, namely, an amendment of the rent law, with a view to determine the principles on which the rent of land should be fixed. The zemindars feel that they are not getting their fair share of the increased value of the produce of the land, while they are uncertain as to the best way of asserting their claims, and the intricate question is often involved whether or not the value of the land and its produce has increased through the agency or at the expense of the ryot. The problem to be solved was how to satisfy the just claims of the landlord, while leaving a liberal margin of profit to the ryot. After much consideration, Sir R. Temple determined to introduce a Bill (which met with the general assent of the Government of India) providing that, in cases where an occupancy ryot is liable to enhancement of rent, one of the two following alternative principles should be adopted for regulating such enhancement, —either (1) the rent rates paid by non-occupancy ryots should be taken as representing the market rates, and a favourable discount (say 20 to 25 per cent.) from such rates be allowed to the occupancy ryot; or (2) the rent of the occupancy ryot should be calculated at a certain proportion (say from 15 to 25 per cent.) of the value of the gross produce. It was, however, determined that no claims for the abatement of existing rents should be entertained in consequence of the new rules. Objections have been made to the second alternative, on the ground that in some parts of Bengal the actual rents levied amount to much more than 25 per cent., reaching even 50 per cent., while in other parts they stand at very much less than 15 per cent. of the produce. The answer to this objection is that in the former class of cases the existing relations between the landlord and tenant will remain untouched, while in the latter (in the absence of any special agreement, such as the original payment of a premium in consideration of a nominal rent) it is quite right that the tenant should not continue to possess an unfair advantage, but that his rent should be gradually raised to the prescribed standard. In the valuation of produce due allowance will be made for the skill, capital, and labour bestowed by the ryot on the superior kinds of staples, such as tobacco, opium, indigo, &c. It is hoped that the result of this measure will be a contented and prosperous peasantry, having heritable tenures with equitable rents, which cannot be enhanced except by the decision of a court of justice, and with full security of enjoying the fruits of their labour.

It appeared from the road cess returns that the rent roll payable to the intermediate tenure-holders was often considerably more than that paid to the superior landlord. While these returns thus showed the prosperous condition of the middlemen, they also pointed to the fact that the profits of the land are gradually slipping out of the hands of the zemindars.

An Act was passed in April 1876 for the compulsory registration of all proprietary titles in lands throughout Bengal. A regulation of 1793 directed that the name of the proprietor of each estate should be entered in a register. This register was not properly kept up, and, as the legislature had during recent years been imposing on proprietors of land many new duties, the performance of which could not be enforced without the responsible person in each case being known, the above measure was determined on for supplying this deficiency. There were no less than 150,000 estates on the revenue roll, besides a vast number of petty revenue-free estates.

Madras.

The "ryotwari" tenure is that which prevails over four-fifths of the Madras Presidency, and is the most familiar to the people. Under it the State, without the intervention of any middleman, collects its tax direct from the cultivator, whose right of property, as long as he pays the land-tax, is indefeasible. The tax is fixed on each field, and additional charges are made when water is supplied to irrigate a second crop on land taxed as growing only one crop, or when it is supplied at all to land taxed as not being supplied. Under this system the revenue expands with increasing population and cultivation.

The remainder of the land is permanently settled, and in most cases the rights of the State have been made over to zemindars. Since the beginning of the settlement the value of these estates has doubled, but the Government derives no benefit.

An "inam" is the assignment by Government of the land tax, or a portion of it, to an individual or an institution, or a grant by way of remuneration for the performance of certain duties. The conditions under which such grants may lapse to Government are various. In 1858 a Commission was appointed to examine the titles of the possessors of inams, and to enfranchise them by commuting, for a moderate quitrent, the right of Government to prevent alienation or to resume. The work of this Commission is being gradually completed. In 1875-76 there were issued 166 title deeds, being 20 less than in 1874-75, but in the amount of quitrent charged there was an increase.

The Bombay Administration Report contains the following remarks relative to the assessment of land in that Presidency :—

"The more absolute the tenure of land the better, and perhaps eventually the last traces of Government as a shareholder will vanish, and that which is now paid to a joint owner entitled to extra profits and liable to unusual losses and interested in the preservation of a culturable soil may in reality become a land tax paid by the owner irrespective of the uses of the land, and liable to increase or decrease according to the exigencies of the State, or perhaps secured from more than a certain rate of increase. But such a position is so distant as to be practically impossible, and, therefore, all Government can do now is from time to time to lay down a theory to guide revision, as has been laid down to guide original assessment. If it is asked to protect that theoretical basis for a period sufficiently long to meet the views of those who desire to lengthen the present leases, so that the net result might be that the assessment would be fixed for a very long period, with liberty to Government to increase that assessment within a certain limit at stated intervals of years, the answer is that it seems impossible at present to make a nearer approach to permanent settlement, or to put Government more into its proper position of collecting sufficient for the maintenance of Government without itself having any ownership in the property of those contributing. The reason for not going further is obvious. If an enlightened people found they had mistakenly cut off the supplies necessary to their national prosperity, they would before long insist on those supplies being secured; in India the revenue has to be raised from a people who have no national spirit, who, however, contribute readily enough in the accustomed way, but who would bitterly resent new schemes of taxation, however desirable, economically or financially, or even the re-imposition of burdens once relieved."

The following statistics have been arrived at respecting the tenure of land in the Punjab. Punjab. Of the total area 16 per cent., and of the cultivated area 44 per cent., is held by tenants, showing that a large proportion of the land is held by cultivating proprietors. The number of tenants with rights of occupancy amounts to 30 per cent. of the whole number; of these, 78 per cent. pay rent in cash, and 22 per cent. in kind, while of tenants-at-will 52 per cent. only pay in cash.

In the total number of suits under the Punjab Tenancy Act there was an increase, which however occurred entirely in suits brought by landlords against tenants; in those instituted by tenants there was a considerable decrease. In the former the increase was in regard to suits for enhancement of rent of tenants with occupancy rights, and for ejectment of tenants without such rights; in the latter the decrease related to suits for establishment of rights of occupancy and for resisting ejectments. On the whole, the Act continued to work smoothly and well.

The questions connected with the Chanda and Nimar settlements were finally set at rest, the orders of the Government of India referred to in last year's Report (p. 27) having been carried into execution. Under these orders, the tenure of all cultivators is to be a permanent one so long as they pay the rent fixed on their holdings. A maximum rent rate is to be determined for each quality of soil, which cannot be exceeded, but within which limit the malguzars may demand what they please, only one enhancement, however, being allowed during the currency of the settlement. On the other hand, cultivators will not be allowed to mortgage or transfer their holdings without the permission of the malguzar, except a person who has become a co-sharer by inheritance or who would inherit the holding on the cultivator's death. Full power to improve their holdings is secured to all cultivators. Central Provinces.

In the early part of 1875-76 several riots occurred in the Poona and Ahmednuggur Collectorate, caused by peasants rising against the oppression of the sowcars or money lenders. These events were followed by an official inquiry, the results of which were under consideration at the end of the year. The relations between debtor and creditor were shown to be most unsatisfactory, but how to place them on a better footing appears to be a question requiring the greatest caution, lest by measures devised for the benefit of the cultivator his right of contract should be so crippled as to induce unwillingness in the sowcars to make advances to him, and so to discourage investment in land. In regard to the recent special pressure upon the ryots the Bombay Government think that, in well-deserved pity for their condition, INDEBTEDNESS OF THE CULTIVATING CLASS. Bombay.

the force which pressed upon the creditors themselves has been somewhat lost sight of. There must either have been a demand for money which they could not meet, or lending must have ceased to be profitable. The disturbance in the circulation and the depression of trade explain the urgent want of money on the part of the sowcars, although this is, of course, no justification of their heartless and unscrupulous action towards their debtors. It is hoped that some amelioration may be effected in the position of the ryots by a modification of the present system of civil procedure.

It is a curious circumstance that, notwithstanding the state of things above referred to, the ryots decidedly prefer dealing with the sowcars to receiving advances from Government. The latter, with a view to encourage agricultural improvements, offer advances, on good security, at interest generally of $6\frac{1}{4}$ per cent. per annum, and repayable over a series of years, but this liberality is not readily taken advantage of. Even when, after floods at Ahmedabad, Government sanctioned the advance of 1,000% to poor cultivators without any interest at all, no one availed himself of the offer, the fact being that the sowcars, when they found there was danger of their clients slipping from their hands, gave them the accommodation which they had before refused. There are few ryots in a position to offend their banker. The great object of the sowcar is to evade repayment; if the season is good he lets the debt run on from year to year at 36 per cent. interest; and this system is preferred by the cultivator to the tedious formalities and rigid terms of repayment attached to Government advances.

Punjab.

The number of sales of land in the Punjab in 1875-76 was greater than that in the preceding year, amounting to 6,600, while the area aggregated 89,320 acres. Of this area, 58 per cent. went to agriculturists. The proportion sold under pressure was 76 per cent., and it is a remarkable circumstance that of land thus sold a much greater portion went to agriculturists than of land sold without pressure.

It is estimated that the present rate of transfers might continue for upwards of 80 years before one-fourth of the land in the province exchanged hands.

Of the land mortgaged during the year, 186,950 acres were on account of debt, and 16,876 acres for the purpose of raising money for agricultural improvements. The area redeemed increased from 35,712 to 70,415 acres, or, taking into account only land mortgaged to non-agriculturists, from 19,608 to 53,790 acres.

The value of land was nearly double what it was six years previously.

The above statistics confirm the view expressed in former reports of this Administration that there is no cause for alarm or anxiety in connexion with transfers of land in the Punjab. The following are remarks by the Financial Commissioner on the subject:—

“After taking into consideration all the facts bearing on this important question, there is nothing to show that these transfers are to any extent brought about in consequence of the pressure of the Government demand, while it is clear that the prices paid are rising largely. That sales and mortgages take place to a large extent is not to be doubted. It is desirable that the landholders should, if possible, retain their lands and should prosper. A large portion of them do prosper, and no one who compares the condition of the village proprietors now with what it was 24 years ago can doubt that a large increase of general prosperity has occurred. The comfortable and well-to-do keep out of sight; the thriftless and indebted are constantly claiming notice; what proportion the former bear to the latter we do not know, but it is not by any means certain that the facts hitherto ascertained are sufficient to warrant interference by the legislature to restrict the transfer of land. Light assessments and a peaceful rule have caused a great increase in the comfort and general ease of the people, and there are grave objections to contracting the liberty under which this prosperity has occurred by placing the whole agricultural population in a state of tutelage for the fault of that section of it which are unable to take advantage of their improved circumstances, until and unless the necessity for such a course becomes absolute.”

The effect of the Land Improvement Act of 1871 having been generally a very marked falling off in the demand for Government advances, the amendment of the rules was under consideration. By the rules framed under the provisions of that Act a more elaborate preliminary inquiry was provided for, and it is believed that the trouble entailed upon tahsildars of inspecting and reporting upon each work induces them to discourage applications for advances. In 1875-76, however, there was an increase in the total demand from 7,436% to 12,037%.

Central Provinces.

On the question whether in the Central Provinces the ancient landholders are losing their property by sale or mortgage, the statistics of the year show that, while the number of deeds of mortgage executed in favour of bankers much exceeded those in favour of agriculturists, the number of actual transfers to agriculturists was double that of transfers to bankers; hence it is inferred that, when the extreme limit of the security is reached or passed, and the property is put up for sale, it is bought in by members of the agricultural community. The

efforts of the Commissioners and Deputy Commissioners to avert the sale of ancestral landed property have, it is hoped, been in a fair number of instances successful.

There were in Bengal 2,514 Government estates, the total revenue demand from which amounted to 188,219%. The funds were liberally utilised for the improvement of the estates. The object was kept in view of making the Wards' estates models of well managed properties. The condition of the tenantry was generally good, and their relations with the managers amicable. In one estate (in Monghyr) the rents had been nearly doubled by the effect of irrigation works. Many of the estates came under the management of the court either on the application of the proprietors themselves or in consequence of testamentary dispositions.

GOVERN-
MENT AND
WARDS
ESTATES,
Bengal.

On the 30th June 1875 (the close of the revenue year) there were 32 Wards' estates in the Madras Presidency. Of the proprietors, 24 were boys and 5 women, the remaining 3 being lunatics. Cultivation on these estates was on the increase. The collections of revenue were less than those of the preceding year, owing to a diminution of the arrear demand. Such of the minors as were capable of it were being educated, and their conduct was on the whole good. Some of them were studying under a European tutor at the capital.

Madras.

The estates in the Punjab of which Government was the proprietor aggregated in area 16,406 square miles, of which about one-ninth part only was cultivated.

Punjab.

The number of Wards' estates increased from 31 to 38. The management of these properties was generally efficient, and they were on the whole thriving and prosperous.

There were 75 estates under the charge of the Court of Wards in the North-West Provinces, the gross receipts of which amounted to 165,000%. Among the beneficial effects of the court's influence are noted the small amount of litigation between it and the tenantry, the liberal advances to distressed cultivators, and the judicious expenditure on permanent and profitable improvements. The financial position of the estates is also referred to with satisfaction. Of the total number, 55 were at the outset encumbered with debts to the amount of 370,000%; at the close of the year 16 of them had been entirely cleared, and the amount of debt remaining on the others was about 222,500%.

North-West
Provinces.

During this year the services of the Superintendents of Encumbered Estates in Oude were dispensed with, under the orders of the Government of India. These officers were originally appointed to manage the estates of certain indebted talookdars, which were taken charge of by Government under an Act of 1870. It was considered that the estates had been long enough under the care of a special and expensive agency, and they were therefore transferred to the direct charge of the Deputy Commissioners; and it was at the same time determined that the debts outstanding upon them should be discharged by advances from the Government Treasury.

Oude.

V.

AGRICULTURE.

SEASONS AND
CROPS.
Bengal.

The harvests of Bengal during 1875-76 were generally favourable; the autumn crops everywhere were excellent. The results varied, however, in the several divisions of the province.

In Burdwan the rainfall was an average one, and on the whole seasonable. The reports from the Presidency Division were for the most part favourable; in the 24-Pergunnahs a plentiful rainfall resulted in an abundant rice crop. In the Rajshahye and Cooch Behar Division the rainfall was generally below the average, but in two districts only was the rice harvest a bad one; in the northern part of Dinagepore the failure was so considerable that apprehensions were entertained of another period of scarcity.

Although the rainfall throughout the Dacca Division was scanty and unfavourably distributed, yet the general outturn of the crops was not below the average. The season in Chittagong was marked by an excessive fall of rain, which in August resulted in serious floods, the water lying 15 feet deep over cultivated fields. Much damage was caused to the early rice crops and other produce, and to horses and cattle, and the flood was succeeded by a drought, which occasioned further injury.

The year opened in the Patna Division with every prospect of plenty, but it closed with an alarming failure of the winter rice harvest. So early as November there were apprehensions of short crops and general distress throughout Northern Behar. On investigation it was found that, although in some localities the failure was almost total, yet the area of failure was a limited one. Notwithstanding these adverse circumstances, the prices of food remained low all over Behar, which was apparently due to the prosperous harvests in other places, from which it was felt that supplies could be obtained through private trade. The Lieutenant-Governor regarded this circumstance with great satisfaction.

The history of the season in Bhaugulpore was similar to that in Dacca, only the failure of crops was not considerable. The year was generally prosperous in Orissa, and there was a magnificent crop of rice. The results were various in the different parts of the Chota Nagpore Division.

In connexion with Dr. Forbes Watson's plan for an industrial survey of Bengal, the attention of the Government has been directed to the defective character of the agricultural statistics of the province. The collection of complete statistics seems to be for the present out of the question, on account of the great cost that would be involved in a cadastral survey of Behar and Northern Bengal. Sir R. Temple has decided that the best plan will be gradually to extend the system inaugurated by his predecessor of obtaining accurate statistics in selected areas. The arrangements introduced by Sir G. Campbell have already borne valuable fruit, all the Deputy Collectors having made laborious and careful inquiries, and submitted interesting reports to Government. In addition to the maintenance and extension of this system, Sir R. Temple will not neglect any other opportunities that may arise of collecting information. A large number of scattered reports and papers bearing on agricultural questions are being arranged as well as circumstances will permit.

Madras.

The season in the Madras Presidency was generally a remarkably dry one. The south-west monsoon failed altogether, and the north-east monsoon also to a considerable extent. Nevertheless the average prices of food grains were, owing to the propitious seasons of 1874-75, on the whole lower than they had been in that year.

Bombay.

In Bombay the season of 1875 was a peculiar and not generally favourable one. The rainfall was considerably above the average, but was irregularly distributed, both as to time and locality.

On the coast the monsoon opened with a fuller fall than usual; but in the interior, whilst the early crops had to be re-sown in many of the western districts, owing to the first sowings having been destroyed by floods, further east the land remained unsown for want of moisture. After the first falls a more or less prolonged drought was experienced in some parts till September, when a very heavy storm passed along the coast districts and over the Guzerat country, flooding the rivers and destroying the standing crops. Thus, in the southern and eastern Collectories the harvest was blighted by the rains ceasing too soon, whilst in Guzerat and the Konkan it suffered from excessive flooding. The late crops fared better, and, taken altogether, the harvests in the Southern Mahratta country and Deccan were sufficient, the yield in the Konkan was good, and in Guzerat occasionally better than the average.

The tendency to contraction of the area under crops, which was noticed in the last Report (p. 32), continued, though not in so marked a degree. On the other hand, the area under

cotton increased ; but for the profit to be derived from that cultivation, it is believed that the abandonment of land in recent years would have been greater than it has been. The year 1874-75 was evidently a period of special depression. A very general improvement in the prices of agricultural produce during the subsequent year stimulated cultivation, while there was also reason to believe that the money lenders were not so active in their efforts to realise capital lent.

The Government observe :—" Where people are content to live as long as the harvests are bountiful and then to die like sheep, a sense of individual distress is lost in what appears to be the overwhelming and destructive fury of fate ; but it has been the object of the political economy of civilised life to recognise the laws which work in the natural world, and to anticipate calamities by gradually removing the cause. A population steadily struggling away from poverty must leave many behind, and those who are thus at the base of civilised society, either because they cannot or will not work, suffer more acutely than if all society were content with a low standard. The Natives have already recognised the vast change which is working. They lament the importations from Europe and the areas of ground under exportable crops, forgetting that, so far from the food area having been curtailed to purchase comforts, it has been largely increased, and that, if there is a pressure now felt, it is the pressure upon idleness and listlessness caused by the new necessity to exertion."

The rainfall of 1875-76 in the Punjab was a very extraordinary one. It amounted in Punjab. depth to 37 inches, being 12 more than in the previous year, and 10 more than the average of the five preceding years ; and this extraordinary increase was confined to the months of August and September, during which in 14 districts the rain was in excess of the average fall of an entire year. The effect was in some respects beneficial, and in others the reverse ; while, on the one hand, there was great destruction of crops, cattle, and house property, on the other hand the abundant autumn rains rendered a large additional area of land available for the ensuing spring crops.

The total area under cultivation amounted to 20,571,423 acres, against 19,968,976 in 1874-75. In the southern districts and in the Derajat there was a large increase in wheat cultivation.

The year was a very unfavourable one for agricultural experiments, and the attempts made to popularise new staples met generally with little success.

The season in the North-West Provinces was not altogether unfavourable, but in the North-West Provinces. north-westerly districts the rains commenced too late, and sowings were therefore retarded. In the autumn heavy falls of rain did a great deal of damage to cotton and Indian corn in the same districts, but these rains were favourable for the sowings of the rubbee, and the harvests were, notwithstanding the absence of winter rains, generally satisfactory.

In the Allahabad district a serious calamity occurred in the flooding of the Jumna and of a mountain stream called the Tons. The confluence of the Jumna with the Ganges heaped up the waters of both to a height unknown before, which covered the lowlands of the station and entered the city of Allahabad ; and only by unceasing exertions were they prevented from extending much further. The floods subsided rapidly, and it was then found that 772 villages had been destroyed or damaged, 181 lives had been lost, and 1,949 head of cattle and 826 sheep and swine had been drowned, while the total damage was estimated at nearly 140,000Z.

The harvests in Oude were, generally speaking, above the average, and there is stated to Oude. have been a nearer approach to prosperity than the province had experienced for some years.

The rubbee harvest in Ajmere was poor, owing to deficiency of water in the tanks. The Ajmere. rainfall of the year, taken as a whole, was favourable ; it was, however, comparatively slight until September, when a remarkable downpour occurred, which proved destructive to many of the tanks, and submerged much land. The khurreef harvest was an average one.

The crops in the rubbee consist principally of wheat, gram, barley, and opium ; the cultivation of the latter is extending.

There was an increase under all heads, as compared with the preceding year, in the cultivated area of the Central Provinces, especially under food-grains, oil-seeds, and sugar-cane. Central Provinces.

The rainfall was, altogether, much above the average ; its general effect appears to have been unfavourable to the khurreef crops and advantageous to the rubbee. In different districts, however, the result was various. On the whole, there was no reason to complain, except in regard to cotton. The lowness of prices was indicative of general prosperity ; indeed, the agriculturists complained that for this reason they were not able to dispose profitably of their produce, and even looked upon their good harvests as almost a misfortune.

Food-grains occupy 12 of the 14 million acres cultivated in the province.

During the five years ending with 1875-76 the area under cultivation in Berar increased Berar. by 1,415,903 acres. The increase during the year under report was 162,905 acres. There

is very little wet cultivation, 98·52 per cent. of the whole territory being occupied by dry crops. There were 20,636 acres under rice, and 74,392 acres of irrigated lands, out of a total cultivated area of 6,398,330 acres. Jowari was cultivated much less than in the previous year, the deficiency being made up by grains, pulses, and oil-seeds; the acreage under linseed was nearly doubled. Tobacco was grown much more largely, while the cultivation of opium decreased.

Coorg.

A rainfall, one-third less than in the previous year, and the least that had been gauged since 1868, affected the outturn of crops in Coorg. On the other hand, the marked rise in the price of food-grains stimulated cultivation, and 1,500 acres of fresh land were brought under rice. The coffee crop is reported to have been, on the whole, good.

British
Burma.

According to the statistics, the accuracy of which, however, cannot be relied on, there are in British Burma 38,866 square miles of culturable land, of which only some 3,717 are actually under crops.

Cultivation continued steadily to extend during the year under report. The rate of increase, 2·23 per cent., was small as compared with that of the previous year (10·77), which, however, was consequent on exceptional circumstances (*see* last Report, p. 34).

The rains in most places were both early and excessive, and there were vast inundations in the deltaic districts of the Pegu division which rendered large tracts of land unculturable; while the area already planted was so long submerged as to destroy all hopes of harvest. At the commencement of the cold season, in the districts of Akyab, Bassein, Thonkwa, and Toungoo there was a serious lack of the usual ripening showers, and the crops in consequence were meagre and poor; but elsewhere more favourable results appeared.

MODEL
FARMS.
Bengal.

As mentioned in the last Report (p. 34), the model farms which had been temporarily established in Bengal have been closed. Their working was expensive, and their beneficial influence was but trifling. The Poosah estate has been retained, but is not used for purposes of general agriculture; tobacco experiments are to be conducted there, and possibly an agricultural college for Behar will be established on it. The latter scheme is in abeyance, as an industrial school which has been opened at Patna will perhaps be found to supply in some measure the want of technical education in Behar.

Madras.

The Sydapet farms, while not a commercial success, are considered by the Madras Government to have produced very valuable results in the way of agricultural experiments, which can be utilised for directing operations in the Presidency generally. It is intended gradually to open similar farms in the districts.

The season was very unfavourable for field experiments, few of which yielded any results except where irrigation was available. An important experiment was in progress for applying irrigation water to the subsoil instead of the surface soil.

A school of agriculture has been established at the experimental farm, with a view to the scientific and efficient training of young men. The lectures will be open to the public, and the course of instruction will extend over three years. Arrangements have been made for securing the services of competent lecturers on the various subjects.

Bombay.

As yet the Bombay Government has taken little active share in the introduction of higher farming, confining itself rather to experimenting on valuable crops and then recommending them for cultivation, a plan which has had marked success in leading to the improvement of the sugar-cane and the cotton plant. But, at no inconsiderable expense, this Government maintain three farms—one in Sind, one in Khandesh, and the third in Dharwar—for the purpose of trying new manures and plants upon Indian soils, of ascertaining the ordinary yield of various crops per acre, of distributing selected seed, and of endeavouring to secure workable machinery by adaptation of mechanical appliances to the rude agricultural instruments of the Native farmer. An attempt has also been made to receive and train apprentices at these farms, and by their means and the issue of popular manuals, for which these farms are collecting materials, some good may be effected. But if the farms merely distribute large quantities of prepared seed they will amply repay their cost to the country, and, as more experience is required, they may do this and yet cover their working expenses.

The three model farms are considered by the Government to have done some useful work during the year.

At the Salaru farm, in Sind, the season was unfavourable. Cultivation was very restricted, and consisted mainly of Native cotton and bajri. Early sowing was tried on well lands, with good results. An acre was manured and ploughed with the English plough, and sown with Sind cotton in March or April, and the yield was 1,884 lbs. seed cotton, or 628 lbs. cleaned. Much injury was done to all the cotton by the green fly. It is stated that the difference between fields ploughed with the English plough and those ploughed with the Native implement is very marked, the latter never being free of grass. The Commissioner in Sind is

of opinion that the farm has benefited cotton-growing in the neighbourhood, and that its area might with advantage be extended.

On the Khandesh farm cotton was the most important crop, nearly the whole being of the Hingunghât variety. The maximum yield was 130 lbs. of clean cotton per acre, the average being 50 lbs. The entire crop, which occupied 139 acres, yielded a profit of 57%. For the first time the receipts of this farm very nearly equalled the disbursements.

The hopes of a good yield on the farm at Dharwar were entirely destroyed by drought and cold winds. With experience and time it is hoped that this farm will become a good test of the producing powers of land, though it may not repay the cost of cultivation.

At the Nagpore Model Farm better success was obtained than in the previous year. The channel from the Ambajhari Lake was completed, making it possible to irrigate 166 acres under crop. Some of the experiments during the year were very successful. On six acres of manured soil 304 lbs. (or 50·6 per acre) of cleaned cotton were raised from seed of the Hingunghât variety. On unmanured land the yield, under the same conditions of season, was only 28 lbs. per acre. Central Provinces.

The number of cattle and sheep in Bombay kept up, but there was no improvement in quality. The disinclination of the Natives to destroy life, and the neglect of gelding, lead to the country being overrun with inferior animals. The horses are rather better, but they have in great measure lost their value since freebooters and intestine troubles have ceased, and also in consequence of the large importation of foreign animals. Seven horse shows were held during the year, four of which were considered fairly successful. The Collector of Poona says that the exhibition held at that place tended to show that the country breed was being gradually but surely improved. AGRICULTURAL STOCK. Bombay.

The scarcity of fodder at the beginning of the year, the destructive floods of August and September, and the general prevalence of cattle disease, combined to make the season in the Punjab an unfavourable one for live stock. For animals affected with the foot-and-mouth disease Colonel H. L. Davies's specific was tried with success in the Kurnool district, but the remedy is an expensive one, and is consequently not likely to come into general use among the people. Punjab.

Attempts were made to improve the breed of sheep and horned cattle by the introduction of superior rams and bulls from the Hissar Farm. The results of the former experiment were so far disappointing, but the Hissar bulls are stated to have done well in all cases where they were judiciously selected and well cared for.

A new cattle fair was established at Hoshiarpur, with tolerable success.

The horse fair held at Rawulpindee was much larger than in any previous year, which showed that good results were being gradually developed. A great drawback in the Punjab to the improvement of the breed is that the excellence of the provincial horses leads to a very early and rapid sale of the young stock out of the province. While this stimulates production it removes much of the material from which improvement might be obtained.

The show of mules at the above fair was remarkably good. Mule-breeding is carried on extensively in the Punjab, and supplies a great want in connexion with the mountain train batteries.

The live stock of British Burma continued to multiply, although cattle disease was very prevalent in three districts, upwards of 14,000 head having died in Amherst alone. The plague is thought to be partly due to the neglect, in extending cultivation, to provide a sufficiency of pasturage. British Burma.

Buffaloes increased from 630,708 to 643,664.

Horses are rare in the country, and are used exclusively as articles of luxury; but ponies increased by 640, and Arab stallions were imported into Thyetmyo and Prome to improve the breed.

Agricultural shows were held at 10 stations, and were fairly successful. The scheme, however, had not yet come to be understood by the Natives, and each competitor expected a prize.

The area cultivated with cotton in Madras increased by 67,982 acres, the increase being chiefly in the Ceded Districts. Many lands were placed under cotton which, but for the dry season, would have been cultivated with "wet" crops. Cotton. Madras.

Several experiments have been made during the last few years on the Sydapet farm with different varieties of cotton. The "Western" variety yielded 353 lbs. per acre. The New Orleans species has been grown with considerable success. This cotton appears to be peculiarly adapted for cultivation under an improved system of farming, being otherwise very liable to run to stem and leaf; it has, however, the disadvantage of great uncertainty in

the time and quantity of the harvests, and, as the latter spread over several months, a considerable expenditure is required in gathering the crop and keeping down the weeds.

Bombay.

The total area under cotton in the Bombay Presidency was one-tenth of the entire land capable of cultivation, and one-third of the land fit for cotton. It amounted (including Native States) to 4,408,235 acres, or 178,639 more than in 1874-75. In the outturn also there was a net increase amounting to 41,212 cwts. of cleaned cotton; in the Northern Division there was a falling off. Both the acreage and the yield exceeded the average of the previous four years, the first by 475,196 acres and the latter by 64,449 cwts. Contrary to the experience of the preceding year, there was a decrease in the area under indigenous cotton of 12,880 acres, while under exotic varieties there was an increase of 191,519 acres.

The heaviest yield per acre was obtained in the Collectorate of Hyderabad, which was also the case in 1874-75. In the Report for that year (p. 35) the yield was stated to have been 287·19 lbs., but it now appears that the correct figure was 319·27 lbs.; even this ratio, however, was exceeded in 1875-76, when the yield amounted to 346·94 per acre. The plentiful rainfall aided this result. The returns obtained in the Salaru and Khandesh farms have been stated above.

The crop was, on the whole, inferior in quality to that of the preceding season. A considerable part was stained on account of rain having fallen at picking time, and no small portion of it was mixed with leaf, the apparent result of carelessness in gathering it in the field.

An interesting experiment was tried of sowing cotton and bringing it up by irrigation about 20 days before the monsoon was expected. On this occasion the success was remarkable.

The working of the Cotton Frauds Act was very beneficial. Adulteration in its grosser forms was met with in comparatively few instances; it appears to have been confined to a district in Kattywar, where the Act is not in force, and to the Southern Mahratta Country, where the saw gin affords peculiar facilities for the practice.

Central Provinces.

Cotton is extensively cultivated in the Wurdha, Nagpore, Raipore, Nursingpore, and Chindwarra districts. The best kind is raised in the two former districts, and there the crop suffered severely during the year under review.

The outturn for the whole of the Central Provinces fell from 251,652 cwts. in 1874-75 to 150,436 cwts. in 1875-76, and the quality of the cotton in the latter year was generally inferior.

CHINCHONA. Bengal.

After 13 years of expenditure on the chinchona plantations in British Sikkim, at first in experiments, and latterly on *bonâ fide* planting, during which period but little return was received, the scale began to turn in 1875-76. In that year no addition was made to the permanent plantations, but the main work consisted in gathering a crop of 211,931 lbs. of red bark. This yield was more than five times as great as that of the preceding year.

The chinchona plantations in the Darjeeling district covered 1,800 acres, and were stocked with about 3,000,000 trees, of which 2,600,000 are of the *succirubra* and 350,000 of the *calisaya* species. The bark of the latter yields chiefly one alkaloid, quinine, the isolation of which can be cheaply accomplished in India; while, in the case of the *succirubra* variety, the separation of the quinine from the other alkaloids would cost too much to be profitable. The *succirubra*, however, contains mixed alkaloids, which, if they could be produced in sufficiently large quantities, would afford a cheap febrifuge for the mass of the people.

The present plantations, it is estimated, can in future supply annually about 400 lbs. of *calisaya* and 10,000 lbs. of *succirubra* alkaloids. This quantity, large as it is, would be quite inadequate for general distribution, and the expediency was therefore under consideration of extending the plantations towards the south-east, where the ground presents remarkable advantages as to soil, elevation, and temperature.

The quantity of dry bark used by the quinologist in manufacture during the year was 107,130 lbs. This yielded only 1,989 lbs. of chinchona febrifuge, but more than one half of the bark was branch bark, which is always poor in alkaloids. It was estimated that 366,000 lbs. of dry bark would be collected in 1876-77; and it is hoped that the febrifuge may be supplied to the public at a cost of less than one rupee per ounce. The alkaloid factory was to be transferred from Rungbee to Calcutta, and worked upon a larger scale in either the Presidency or the Alipore jail. It will there be more under professional supervision, and have greater advantages in respect of mechanical appliances.

In gathering the bark, attention was paid to the important objects of assisting future cultivation and of adding to the practical knowledge of the best methods of harvesting. The practice of uprooting the entire tree was adopted, in order to save the loss of bark which arises from the fact that, after coppicing, a certain proportion of the stools fail to shoot. The root bark thus made available for manufacture was found to contain about 8 per cent. of alkaloids, or 1 per cent. more than the finest stem bark. The practice of stripping bark from

living trees was not resorted to during the year, as it was found that the removal of bark under moss was rendered impossible in Sikkim by the attacks of ants. It is thought probable that this method of harvesting bark, which is so successful in the Nilgherry plantations, will be entirely abandoned in Sikkim.

The total number of chinchona plants in the Nilgherry plantations at the close of 1875-76 was 1,190,458, about equally divided between the *succirubra* and *officinalis* species. The harvest of the year amounted to 65,170 lbs. The season was a favourable one for the plantations, though, owing, it is believed, to the deficient rainfall, some slight damage was caused by unusually severe frost. Madras.

The importance of careful weeding and watering was demonstrated by the more vigorous growth of the plants and increased yield of bark. On the other hand, special manuring was not followed by any appreciable effect.

The advantages of the mossing over the coppicing process were also established by the experience of this season, as regards both more speedy production and superior quality. The objection existing to this process in Sikkim and Ceylon, owing to the attacks of white ants and other insects, does not apply to the Nilgherry plantations.

There was a very great increase in the area under tea cultivation in Darjeeling, in the out-turn of tea, and in the number of both Europeans and Natives employed in the industry. The area advanced from 18,888 to 22,162 acres, and the amount manufactured increased by 686,988 lbs. But this increase in quantity was obtained by a sacrifice of quality; the mechanical appliances and the available amount of labour were not sufficient properly to work up the leaf, and the strain upon the plant caused by continuous overplucking is believed to have produced a temporary deterioration in the character of the leaf. TEA. Bengal.

The same fault was observed in the preceding year, and it is said that attention has at length been thoroughly roused to this matter. The returns of the season of 1876 already showed improvement.

The tea industry advanced in the Kangra district; the area and outturn were respectively 6,580 acres and 592,200 lbs., as compared with 5,620 acres and 492,572 lbs. in the preceding year. Punjab.

The experiment in tobacco cultivation was commenced in April 1875 on the Ghazeepore stud lands. About 1,200 acres have been rented by a Calcutta firm at about half-assets rates, and the firm have been allowed the rent-free use of the stud buildings, on condition of their importing from Virginia a carefully selected tobacco curer, and placing a certain acreage every year under tobacco. At the end of five years, if their enterprise has proved successful, they will be allowed to retain the farm at the same rate of rent. Only a few acres were planted during the year under report, very little of the land being in a fit condition for tobacco. The curer arrived in January 1876. He cured a sufficient quantity to send as samples to the English and Australian markets, in the former of which it has been classed at a price sufficiently high to encourage further efforts. TOBACCO. North-West Provinces.

While further progress was made in Bengal during the year under review in the formation of reserves, attention was principally bestowed on the improvement and working of the forests. The area added amounted to 1,118 square miles, making altogether 2,585 square miles. The forests still remaining for exploration are of no great importance. FORESTS. Bengal.

It is not probable that any further additions will be made to the reserved area in the Soonderbuns. The Conservator recommended that the whole of the unleased area should be placed under the Forest Department; but the Lieutenant-Governor considered that the reserved tract should be limited to the smallest area compatible with the effectual preservation of the valuable soondri timber.

The area of plantations was increased by 63 acres. The teak plantations in Chittagong were reported to be very promising. Two experiments were made in Darjeeling: one was the rearing of a number of seedlings of the *Ficus elastica*, which were stated to be doing well; and the other, the laying out of a small bamboo plantation, with the object of ascertaining whether the bamboo can be successfully cultivated as a material for the manufacture of paper.

Considerable progress was made in the demarcation of boundaries. The measures taken for protection from fire were in some cases thwarted by the excessive dry weather which prevailed during the early months of 1876. A case is mentioned of a nursery being entirely destroyed through a burning leaf, which dropped upon it in the presence of three forest officials, whose utmost efforts to check the conflagration were of no avail.

It was decided to establish a school of forestry for training the Natives of Bengal for this work, which, in respect of climate, is better suited to them than to Europeans. No Natives will be employed in forestry except those that have passed through this school.

Madras.

The Forest Department in Madras was separated during the year, and its control re-transferred from the Revenue Board and Collectors to the Conservator.

The number of plantations in 1875-76 was 78; in the former year it was 56. The area planted increased from 5,748 to 7,952 acres.

Bombay.

Demarcation was vigorously carried on in the Presidency of Bombay, and some additions were made to the reserves. It is believed that State forests and other properties in trees are considerably plundered, and the need for forest legislation becomes increasingly urgent as demarcation proceeds. Much work was also done in plantations. In the Patna reserves of Khandesh 389 acres were planted with babul, teak, and other trees, and in the Dhulia reserve teak was sown over 100 acres, and nurseries for teak were formed.

Punjab.

The tracts under the control of the Forest Department in the Punjab comprised an area of 9,300 square miles, of which 3,590 were reserved.

In the Sutlej Division 30 acres were turned up and sown with deodar, and much was done in sowing and planting in other parts also. The Rawulpindee forests suffered much from fires, of which 32 occurred during the year, extending over a total area of more than 33 square miles.

North-West
Provinces.

Additions were made to the reserved forests of the North-West Provinces to the extent of 1,211 square miles. The work of protection from fires proceeded, and large areas were added during the year. Considerable damage was done by fires in some parts; in the Dehra Doon four fires occurred in one month, destroying 3,200 out of 7,685 acres of strictly conserved forests. In Goruckpore about 33,900 out of 73,408 acres were destroyed. Planting was extensively carried on in some divisions, and progress was also made in demarcating forest boundaries.

Assam.

The area added to reserves in Assam during 1875-76 amounted to 430 square miles. Of this area, 348 square miles were in the Eastern Dooars, which contain the most valuable forests in Assam. These had remained almost without protection until 1872, when they were declared open forests; but during the year under report the Chief Commissioner recognised the urgent necessity for having them strictly conserved.

An area of $46\frac{1}{2}$ square miles at the foot of the Akha Hills was declared a reserve, with a view to the securing of ample forest land for the extension of caoutchouc plantations.

Except from the reserves, ryots are allowed to supply all their wants free of charge from the Government forests. The valuable sâl forests in the valley districts had nearly all been worked out before conservancy commenced, and they require many years' rest and care before felling can be resumed in them.

Experiments made with seedlings and the planting of saplings were successful, but it was not intended to continue them, as planting in the province is expensive, and sâl forests will spread naturally if only fires are kept out. It was also determined not to extend the plantation of exotic trees, the revenue from which is not large, but to employ all available funds in the improvement of the natural forests.

There are no regular and certain timber markets in the province, and an export trade exists only in the Goalpara and Kamroop districts in sâl timber. The development of a trade in other kinds of timber from the districts higher up the Brahmapootra will have to be attempted very cautiously, so as to prevent financial losses on such operations. The sâl timber produced in the Gowhatty Division has hitherto been almost entirely required by the Public Works Department, but as now nearly all the bridges on the Assam Trunk Road have been completed, logs will in future be despatched to Bengal for boatbuilding.

Two great dangers to which forests, particularly in the Garo Hills, are exposed are "jhooming" and fire. The first of these is a method of cultivation adopted by the Natives, namely, the application as manure to the fields of the ashes and charcoal from burnt wood. Nearly a whole reserve, and portions of two others, were consumed by fire in the Gowhatty Division. The extent and luxuriant growth of grass make fire protection a peculiarly difficult task in Assam. The fires just referred to came from outside, burning for miles, and could have been extinguished by the villagers long before they reached the reserves; indeed they would probably never have happened were not the villagers extremely reckless in letting fires spread from their fields or grazing grounds. The small establishments of the Forest Department were very active throughout the province, and in one or two instances the people from adjoining villages did their utmost to put out fires, but in the majority of cases protection was effected by resort being had at the last moment to the extreme measure of setting fire to the grass outside the fire-strips, and burning away from the forest.

Fire protection will be exceptionally difficult in the Eastern Dooars, where the reserves are surrounded by enormous areas of land on which the grass grows to a height of 6 to 10 feet and more. The mischief there originates chiefly with the woodcutters, who set fire to the grass to enable them to find and remove the dead timber.

In the Golaghât Division there is another source of danger. The surrounding hill tribes descend into the forests and make large clearances, which they do in a very short space of time, and which only the most active vigilance could prevent.

The State reserves in the Central Provinces were further increased in area, and met the general wants of the people in all classes of forest produce. Increased success was also attained in the protection of the reserves from fire. Central Provinces.

The unreserved forests, although some of the best of those formerly coming under this head had been added to the reserves, yielded a larger revenue than in any previous year.

Experiments in the propagation of lac were continued, but with varying success. In some cases where there were failures a second trial proved successful. In regard to these experiments, the Chief Commissioner observes, "there is much to learn yet."

Satisfactory progress was made in demarcating reserved forests in the Hyderabad Assigned Districts. Berar.

One of the most important duties devolving on the Berar Forest Department is the supply of babul wood for fuel, the Steam Cotton Pressing Mills being to a great extent dependent on it.

The protection of forests in the Melghat from fire is said to have brought about a decided change in the climate, the excessive cold being now very trying to young plantations; but this is more than compensated for by the increased facilities for natural reproduction.

The forests of British Burma have a peculiar advantage in the paucity of obstructive interests. A special scheme of departmental work and organization was sanctioned by the Supreme Government in 1874, and consequent efforts in conservancy and culture have been both strenuous and successful. The year under report was a period of much energy in administrative measures. The gross revenue rose from 107,480% to 177,902%, while the proportion of charges fell from 61 to 44 per cent. At the commencement of the year the area of State reserves comprised— British Burma.

	Ares.
Teak	335,880
Cutch	17,600
Fuel	39,313
Total	392,793

During 1875-6 no addition was made to the teak and cutch appropriations; but the fuel reserves were increased by 32,294 acres, for the benefit of the Rangoon and Irrawaddy Valley State Railway.

Several new forest tracts were visited and explored; fire protection was effective in all the reserves; and upwards of 500 acres were planted with or prepared for the more valuable timber. The outturn of teak advanced from 35,568 to 46,597 tons, and of other woods from 4,664 to 11,754 tons.

The export of teak from the two provincial seaports amounted to 162,164 tons, as compared with 115,806 tons in 1874. Though the trade is steadily increasing, the traders' profits are lessening fast; the cost of extraction is higher each year as the supply gets scantier and further removed, while the Home and Indian markets are too overstocked to allow a proportionate rise in price.

VI.

PUBLIC WORKS.

IRRIGATION.
Bengal.

No new irrigation works of any importance were undertaken during 1875-76 in Bengal. The total outlay of the year on irrigation was 525,577*l*. More than 45,000*l*. was spent on the maintenance and improvement of embankments.

Madras.

The outlay on irrigation in Madras during 1875-76 from "extraordinary" capital was 59,408*l*., and from "ordinary" capital 43,935*l*.

In the Godavery Delta 450 miles were ready, or nearly ready, for navigation; and the system irrigates about 513,143 acres. The total capital outlay under all heads on these works to the end of the year under review was 736,444*l*.

The area irrigated by the Kistna Delta system is 226,226 acres; the total expenditure reached 463,590*l*.

The net revenue from the capital outlay on the Godavery, Kistna, and Cauvery Delta works for a series of years was estimated at 21·25, 15·48, and 85·81 per cent. respectively.

The principal expenditure from revenue was on the Madras waterworks and the Cumbum tank works. In regard to the former, little was done beyond maintaining the works in good order. Cumbum had suffered much from fever, the cause of which was traced to the neglected state of the irrigation channels and land drainage; the work of clearing and restoring the watercourses was seriously taken in hand in 1875-76.

The Madras Irrigation and Canal Company remained in an unsatisfactory condition. The total expenditure in India from the commencement reached 1,583,309*l*. In 1875-76 estimates were sanctioned for 6,469*l*. There was very little extension of irrigation during the year; the operations consisted chiefly in the removal of silt, raising and strengthening of embankments, and repairs to lock gates, &c. In the upper portions no clearance had been made for four years, and the accumulation amounted to 76,000 cubic yards. The financial prospects of the canal were as bad as ever; the question of utilising it for navigation was under consideration.

Bombay.

Of 401,038*l*. expended from Imperial funds on public works in Bombay, 194,393*l*. were devoted to irrigation, to a great extent in connexion with tanks and reservoirs, there being, with the exception of Sind, no extensive canal system in the Presidency. In Sind the works on the Begari Canal were continued. The Desert Canal was widened, and was also extended in length from 36 to 52½ miles. The Sukkur Canal likewise made progress, and various improvements were effected in other canals. Six miles were added to the Kusmore embankment, in connexion with which there was much difficulty in procuring sufficient labour.

Punjab.

Extensive repairs to the works of the Baree Doab Canal were rendered necessary by the floods. Good progress was made on works connected with the Jumna and Sirhind canals.

Captain Grey's project in the Ferozepore district was referred to in the last Report (p. 44). During 1875-76, 43,331 acres of land received water from these canals, and the area would have been greater but that the necessity for artificial irrigation was to a great extent obviated by the unusual rainfall.

In the Sirsa district two large and beneficial schemes were successfully carried out by the Deputy Commissioner, Mr. Wakefield.

North-West
Provinces.

The following six systems of irrigation in the North-West Provinces were in operation prior to the year under report:—(1) the Ganges Canal; (2) the Eastern Jumna Canal; (3) the Doon canals; (4) the Rohilkund canals; (5) the Bijnor watercourses; (6) the Bundelkund Irrigation Works. On these six systems the capital sunk by the British Government up to the end of 1875-76 amounted to 3,269,778*l*., of which 78,324*l*. were spent during the year. On works under construction, viz., the Lower Ganges Canal, and the surveys for the projects in Bundelkund, the expenditure up to the close of the same year was 904,517*l*., and that during the year 254,469*l*.

The net profit on the old works was calculated at 5·78 per cent. on the whole capital sunk. The per-centages of net direct profits from the Ganges and Eastern Jumna canals were 3·80 and 15·63 respectively; or, including indirect profits, 6·01 and 25·19. The steady increase for several years past of the area of irrigation indicates the general prosperity of these canals.

The works on the Agra Canal were, with few exceptions, complete. The heavy floods of the year severely tried these works.

RAILWAYS.
East Indian
Railway.

On the East Indian Railway the returns both of passengers and of goods were increasing. The works on the line were severely tested by an unprecedented flooding of the Jumna, which, however, left the bridges both at Delhi and at Allahabad uninjured. The net earnings of the Main line during 1875 amounted to 1,546,609*l*., which gave a per-centage of 5·7 on the guaranteed capital. On the Jubbulpore line the earnings showed a large falling off.

The Eastern Bengal Railway held its ground, but no more. The passenger traffic recovered from the depression caused by the distress of the preceding year; the goods traffic, however, declined by 30 per cent. The efforts to control the Ganges at Goalundo having failed, and the works having been carried away by floods in the autumn of 1875, the scheme has been entirely abandoned, and the line will be shifted wherever the river encroaches. Bengal Railways.

The traffic on the Calcutta and South-Eastern Railway was carried on without interruption and was on the whole improving.

The Durbhunga Railway has been placed on a permanent footing, and an extension has been sanctioned to Mozufferpore. The line promises to be very useful in the conveyance of food-grains.

The good progress made during the year with the Northern Bengal Railway is highly commended by the Lieutenant-Governor. From the northern bank of the Ganges to Julpigoree the length of line amounts to 173 miles, and this was completed to a point 20 miles from Julpigoree, excepting a break of five miles through a low swampy country. Considerable engineering difficulties had to be grappled with; the foundations of all the bridges were, however, laid with great skill, so as to ensure absolute stability. When opened to Julpigoree, it is anticipated that this line will give a great impetus to the progress of Northern Bengal, but there will then still remain the extension to Adulpore, at the foot of the Darjeeling Hills, which will be of extreme importance in the development of European industries in the Eastern Himalayas and in furnishing the means of providing in future against the effects of drought and scarcity. The magnitude of the tea interest may be seen from the fact that the exports from the Darjeeling district reach 4,000,000 lbs. per annum, while the goods and materials imported by planters amount to about the same weight. The length of 33 miles between Adulpore and Julpigoree passes through a well inhabited and cultivated country, rich in natural resources of every kind. The preservation of the State forests in the hills will cause much timber to be brought to market, and this traffic, in which Government has a large interest, will be much facilitated by the extension to Adulpore. The maintenance of European troops at Darjeeling, the Local Government observe, is not only beneficial to their health, but has a useful moral effect on the surrounding country and the neighbouring frontier.

On the Madras Railway there was no increase of mileage during the year. The total capital expenditure up to the end of 1875 was (taking the rupee at 2s.) 10,292,699 $\frac{1}{2}$ l., being at the rate of 12,010 $\frac{1}{2}$ l. per mile. The net profits of the year amounted to 1.71 on the above. From the commencement of construction the profits have averaged 2.1 per cent. per annum. A large decrease in the passenger traffic was attributed to the unhealthiness of the year; there was every prospect of the third class traffic reviving. Madras Railways.

From the 1st July 1874 the Great Southern of India and Carnatic Railway Companies have been amalgamated under the title of the South Indian Railway Company. The net profits of the year were 2 per cent. on the capital expenditure, the profits from the beginning having averaged 1.45 per cent. The third class passengers amounted to more than 98 per cent. of the total number. Both the northern and southern extensions of this railway made good progress; the large bridges were being carefully constructed. On the latter extension the section between Trichinopoly and Madura (96 miles) was opened for public traffic on 1st September 1875; and the section between Madura and Tuticorin (98 $\frac{1}{2}$ miles), together with the Tinnevely branch (18 miles), was available to the public from 1st January 1876.

There was no addition made during the year to the length of open line on railways under the control of the Bombay Government, but a small extension of the Dakore branch of the Bombay, Baroda, and Central India Railway to the town of Pali was sanctioned. The rebuilding of the railway bridge over the Sabarmuttee river at Ahmedabad, which was swept away by floods, made very rapid progress during the year. The gross receipts of this railway for the year 1875 were 585,454 $\frac{1}{2}$ l., and the expenditure was 318,543 $\frac{1}{2}$ l. A considerable increase in the coaching traffic was due to the visit of the Prince of Wales. The transfer of the railway telegraph to Government was finally arranged. Bombay Railways.

In the case of the Great Indian Peninsula Railway the receipts amounted to 1,973,084 $\frac{1}{2}$ l., and the expenditure to 932,786 $\frac{1}{2}$ l. Here, again, the Prince's visit was the occasion of a large increase in the receipts. But for that circumstance, receipts from the higher classes of passenger fares would have shown a falling off; those for the third and fourth classes were more satisfactory. A further liberal concession was made by the Company for the benefit of the lower class passengers; the charge for extra mileage over the ghâts was abolished, and the fourth class fare of 2 $\frac{1}{2}$ pies per mile extended over the entire line. In the earnings from goods traffic there was also a considerable improvement, owing to increased carriage of grain for exportation. Several important engineering works were in progress on this railway, such as a new terminus at Boree Bunder, and new workshops at Parell.

The Nizam's State Railway and the Berar State Railway are worked by the Great Indian Peninsula Company. The terms on which this is done having been unexpectedly found to

result in a direct pecuniary gain to the company, which had not been intended, it was in contemplation to revise the agreements in both cases.

Punjab
Railways.

The number of passengers on the Sind, Punjab, and Delhi Railway increased in all classes; on the Punjab section the third class traffic showed a decided improvement, owing, it is believed, to the running of local trains to suit this class of passengers, and also to a reduction in the fares. The rolling stock of the company was improved, with a view both to carry increased weight and to afford greater comfort to travellers. The net earnings on this line in 1875 were 199,621*l.*, or about 310,000*l.* less than was needed for the guaranteed interest.

The metre-gauge line from Lahore to Wuzeerabad, on the Punjab Northern State Railway, was opened to the public on the 12th April 1875. The Alexandra Bridge over the Chenab was opened by the Prince of Wales in January 1876. The bridges over the Ravee, Chenab, and Jhelum stood most successfully the heavy floods of the autumn, although the permanent way was in some places injured.

The Indus Valley Railway was delayed to some extent by extraordinary floods of the Sutlej and Chenab rivers, from which, however, the works at the Sutlej Bridge sustained no injury. These floods submerged and wrecked nearly 40 miles of the incomplete line, causing an estimated damage of some 20,000*l.*

North-West
Provinces
and Oude
Railways.

At the beginning of the year, 539 $\frac{3}{4}$ miles of the Oude and Rohilkund Railway were open for traffic, and 542 $\frac{3}{4}$ miles at its close. The traffic earnings amounted to 275,122*l.*, against 200,402*l.* in the preceding year; and the net profits were 110,849*l.*, against 71,320*l.* There was a satisfactory advance in both passenger and goods traffic.

The Cawnpore Ganges Bridge (25 spans of 110 feet, wrought-iron lattice girders) was completed and opened in the year under report. The opening of this bridge, and of a new junction with the East Indian Railway, diverted to that route some of the through traffic which formerly went by way of Benares, and as that traffic was of a comparatively high class, the loss to the Oude and Rohilkund Railway was not balanced by the increase of low class goods *via* Cawnpore.

A project was prepared during the year for the prolongation of the Benares branch by means of a temporary tramway to a station on the left bank of the Ganges at Rajghat, with the object of picking up the river traffic and lessening the distance to the East Indian Railway.

In October 1875 the Hathras and Muttra line was opened for traffic. There was not time to judge of its success, but it was anticipated that it will prove a useful and remunerative undertaking.

No further steps were taken in the matter of the proposed construction of a branch from Moradabad to Ramnuggur. Inquiries were being made into the traffic of the large marts situated near this line, and the Nawab of Rampoor was desirous of connecting his capital with it by making another line of the same gauge 14 miles in length.

Rajpootana
State Rail-
way.

On 1st August the Rajpootana State Railway was carried on to Ajmere by the completion of an extension of 48 $\frac{1}{2}$ miles from the Sambhur Junction. The enormous traffic, both in goods and passengers, which immediately took possession of the line was such as to cause for a time actual embarrassment to the traffic department. On 1st January 1876 the bridge across the Jumna at Agra was opened for broad gauge traffic; and in February the branch of 14 $\frac{1}{2}$ miles from Ajmere to the military cantonment of Nusseerabad was opened to the public.

This completes the system as far as at present undertaken. Its extension towards Neemuch and Ahmedabad, besides bringing Agra and Delhi 300 miles nearer to Bombay, will greatly benefit those parts of the country where at present traffic is impeded by bad roads, insecurity, and transit duties.

ROADS AND
BRIDGES.
Bombay.

Much was done during the year in the Bombay Presidency in road construction, and a considerable number of bridges were built or in course of building. One bridge, to cost 70,000*l.*, was begun over the Tapti river at Surat, where the river is 1,700 feet wide. It is to consist of 17 spans of wrought-iron lattice girders, carried upon piers formed of iron cylinders.

Punjab.

In the Punjab the amount of work in the maintenance and repair of roads was unusually heavy in consequence of the destructive floods. Various unmetalled roads were improved and maintained. Of the road between Kangra and Ladakh, the portion within Cashmere over the Lachalang Pass was considerably improved, principally at the expense of the Maharajah.

Central Pro-
vinces.

Progress was made with the new road from Jubbulpore to Mandla, which will, when finished, play a very important part in the development of the Chutteesgarh country. Considerable advance was also made on the Saugor Road. Altogether 33,925*l.* was expended on new roads, and 19,081*l.* on repairs.

Progress was made with an important work that had been commenced in July 1874, namely, the remodelling of the southern road from Wurrora to Chanda, which will form a very useful feeder to the Wurda Valley Railway, of which the terminus is the Wurrora Colliery.

The work of constructing a harbour for Madras, at an estimated cost of 565,000*l.*, was begun during the year, on the design of Mr. Parkes, which consists of a close harbour, providing accommodation for 13 large ships to swing at their moorings, or three times that number if more closely moored, besides smaller craft. The enclosure is formed by two breakwaters of packed concrete blocks of about 27 tons in weight, laid on a rubble base of from 4 to 20 feet in depth, running from the shore parallel to each other, with a space of 1,000 yards between them; after running out for 1,200 yards into seven-fathom water they turn at right angles, so as to leave an entrance of 150 yards. It is calculated that the saving in the cost of landing and shipping goods will more than repay the interest on the outlay.

MADRAS
HARBOUR.

During the year 2,657 vessels, with an aggregate burden of 269,544 tons, passed through the Paumben Channel; four were British registered ships, and 18 coasting steamers. The number of vessels having decreased and the tonnage increased, it is evident that the channel is being used by a larger class of ships. An island named Mooram Shullee Teevo, at the southern end of the chain of reefs which forms the shelter for the inner harbour of Tuticorin, has been completely submerged by the sea.

PAUMBEN
CHANNEL.

The Oyster Reef Lighthouse was completed for a cost of 57,813*l.*, or 45*l.* less than the estimate; the light was exhibited for the first time in May 1876.

OYSTER REEF
LIGHTHOUSE.

The first report of the new department of Marine Surveys has been recently issued. Since the abolition of the Indian navy in 1861 no systematic surveys of the Indian coasts had been undertaken, though the increasing coast trade had rendered this aid to navigation a most pressing want. At the instance of the Secretary of State the Government of India took the subject into careful consideration, and after some years' delay the new department, under the superintendence of Commander A. D. Taylor, late of the Indian Navy, was organised on the 25th October 1875. Besides surveying ports, harbours, river entrances, anchorages, &c., the new department is charged with the duty of compiling an annual wreck chart, an annual descriptive list of lights (two of which lists have already been issued, uniform with the Admiralty lists), and sailing directions for the Indian coasts. The superintendent is also consulted on the lighting and marking of sea approaches to all ports and rivers, and on the navigation of rivers, and other kindred matters. The annual cost of the department is under 20,000*l.* Much useful surveying work has been accomplished on the Travancore coast, at Coconada, in the Hooghly and Roohnarain rivers, along the eastern coast of the Bay of Bengal, and especially in the approaches to the Rangoon river.

MARINE SUR-
VEYS.

VII.

MINERAL RESOURCES.

COAL.
Bengal.

Investigations made in Orissa with a view to the discovery of coal in places accessible by a water route resulted in disappointment, and the Talchere coalfields will therefore, for the present at all events, be abandoned.

In the Pachamba subdivision of the Hazareebagh district there were five coal-mines at work. In one, worked by the Kurharbari Coal Company, operations were commenced in November 1875, and 600 tons of coal were raised before the close of the year.

The northern portion of the Manbhoom district is believed to be rich in coal, but only two mines were in operation.

Central Pro-
vinces.

Coal-mining at Wurrora was prosecuted with vigour. A regular output of coal had commenced, averaging daily 50 tons gross, with every prospect of a steady increase. Two serious difficulties stand in the way of the development of this industry. One is the difficulty of procuring labour. The irksomeness of working below ground is aggravated to the Native workman by the groundless fear of danger, and his habits are also against any constant work. The coolies at Wurrora, as soon as they have saved up a little money, and precisely at the moment when they are becoming really useful, go off to spend their gains at their own homes, and, as they have no stock in trade, it would be useless to enter into engagements with them for a term of service. The other drawback is the large amount of small coal and slack extracted with the larger coal. This coal is practically useless; labour has been vainly employed in getting it, and, when got, there is the difficulty of getting rid of it. Two methods present themselves of dealing with this matter. It is proposed that, if coal-cutting machinery has been found to be successful in England in increasing the proportion of large to small coal extracted, it should be introduced at Wurrora. Another proposal is to utilise the small coal by attempting to convert it into patent fuel, but how this can be done could only be decided by a series of experiments.

Exploration in the Satpura region of the Nerbudda Valley was continued, but so far without success.

The Mhowpani mine was steadily worked, and during 1875 supplied the Great Indian Peninsula Railway with nearly 20,000 tons of coal, a larger amount than in any previous year.

IRON.
Central Pro-
vinces.

The experiments in Chanda in iron manufacture had not as yet fulfilled the expectations formed regarding them, but this was owing, not to any defect in the ores, but to the quality of the Wurrora coal. It is hoped, if this unfavourable condition cannot be remedied, that the coal will be found suitable for reducing the ore by the "direct" process.

GOLD AND
TIN.
British
Burma.

Metalliferous minerals in British Burma are chiefly found in the Tenasserim division: tin in Mergui and Tavoy; lead in Maingay island, Amherst, and Toungoo; iron in Amherst and Shwe-gyeen; copper and antimony in the hill confines of Toungoo. Gold exists in the Shwe-gyeen river, a limpid stream which flows from the western hills. A special report on the minerals in the north of this division was submitted by the late Mining Geologist in May 1875. After prolonged local inquiries he came to the conclusion that the minute quantities of gold which appear to be found do not come from quartz reefs, nor are they brought down the rivers from their sources; but are sparsely disseminated throughout the granite of the country, where they are found in the disintegrated *débris*.

Tin is the only metal which is worked scientifically and well. The mines to the south of the Mergui district, in the townships of Lenyah and Malewoon, have always attracted considerable attention, and the ore is said to become more plentiful the further south it is followed. A European firm three years ago took a lease of the Malewoon mines, and have opened out roads and imported machinery with a view to their thorough exploitation. Several large and valuable lodes have been struck, pronounced to be equal in yield to some of the best Cornish mines; but the outturn of metal has hitherto been inconsiderable, owing to the time which has intervened in obtaining machinery and the milling furnaces. Large quantities of crushed ore have, however, been collected, and are available for smelting. Elsewhere, the mines are worked by Chinamen, who use no machinery, but excavate cuttings from 15 to 20 feet below the surface, and sift the earth in artificial channels. The metalliferous deposit is then melted in a rude kind of furnace.

VIII.

MANUFACTURES.

Cotton manufacture is carried on in Bengal to a very limited extent.

COTTON.
Bengal.

Dacca muslin is now only made to order. Three pieces were ordered by a Native gentleman for presentation to the Prince of Wales; each piece measured 20×1 yards, but the fineness of the texture was such that the weight was only about $3\frac{1}{2}$ ounces.

In the town of Bombay, and Coorla (a village in the neighbourhood), there were during the year 24 cotton mills working, containing 689,950 spindles and 7,039 looms. In the up-country districts eight mills were at work, with 125,153 spindles and 640 looms. Since the close of the year another mill, with 10,000 spindles, was opened at Nariad, and six more were in course of completion, which would altogether raise the number of spindles to 963,983. These mills do a large trade in yarn and in the coarser cloth, and find ready markets for all they can produce.

The number of steam gins was 2,585, being an increase of 206.

In the number of presses licensed and worked in British territory there was a decrease of 28, of which 22 were half presses, and 6 full presses worked by steam. The diminution in the number of full presses was confined to the capital, and was due to the increase of full-pressing up country. Of 1,010,284 bales exported from the Presidency, more than 500,000 were full-pressed before they reached Bombay.

In connexion with this subject it may be here mentioned that there is at Nagpore, in the Central Provinces, an association of Native gentlemen co-operating with societies in the Bombay Presidency with the object of encouraging the trade in country-made clothes to the exclusion of the European manufactures. The association does not aim at any profits at all, but the motive is said to be purely a patriotic support of the Indian manufacture; and the members wear as far as possible only country-made stuffs. This movement shows that the decline of Native manufactures is a popularly accepted fact.

Berar is essentially a non-manufacturing district. The weaving industry, which in former days was the chief occupation of the inhabitants of the larger towns, has gradually given way before the importation of English and Bombay piece-goods, and is now almost limited to coarse descriptions of cloth.

Berar.

There were altogether 29 full presses at work, which on an average pressed 7,357 bales of cotton. One press, opened during the year, was the first established under Native management.

Various causes have combined of late years to affect the Bengal silk industry, namely, the growing preference in Europe for woollen fabrics, the competition of Chinese and Japanese silks, the increased production in Italy, and frequent attacks of the silkworms by an incurable disease. There was, however, some prospect of a revival in consequence of a failure during the year in France and Italy. Silk-weaving, although it has shared to some extent the fate of silk-spinning, is still an important industry in Bengal.

SILK.
Bengal.

A considerable impulse was given during the year to sericulture in the Punjab by the establishment of a factory in the Gurdaspur district for reeling silk from the cocoon, and by the offer of annual prizes by the Gurdaspur District Committee to producers of cocoons.

Punjab.

The tussur silkworm being found to exist in considerable numbers in the Gurdaspur, Hoshiarpur, and Kangra districts, experiments were commenced for rearing the worm on a large scale, with a view to the possible development of a new industry in tussur silk.

IX.
TRADE.

The total foreign trade of British India (exclusive of Government stores and treasure) during 1875-76 was as shown below :—

	Imports.		Exports.	
	Merchandise.	Treasure.	Merchandise.	Treasure.
	£	£	£	£
Bengal - - -	17,767,175	1,080,545	23,747,060	745,943
Madras - - -	3,891,939	562,352	7,205,840	272,512
Bombay - - -	13,481,086	3,599,057	21,664,437	1,078,912
Sind - - -	343,067	2,593	1,706,718	13,170
British Burma - -	1,629,401	56,175	3,734,070	4,607
£	37,112,668	5,300,722	58,058,125	2,115,144
		£42,413,390		£60,173,269
		£102,586,659		

Compared with the two preceding years,* the results are as follows :—

	1873-74.	1874-75.	1875-76.
IMPORTS :	£	£	£
Merchandise - - - - -	31,628,497	34,645,262	37,112,668
Treasure - - - - -	5,792,534	8,141,047	5,300,722
TOTAL IMPORTS - - - - -	37,421,031	42,786,309	42,413,390
EXPORTS :			
Merchandise - - - - -	54,960,786	56,312,260	58,058,125
Treasure - - - - -	1,879,071	1,592,721	2,115,144
TOTAL EXPORTS - - - - -	56,839,857	57,904,982	60,173,269
TOTAL TRADE - - - - -	94,260,888	100,691,291	102,586,659

The total trade exceeded by 1·88 per cent. that of the preceding year, which in its turn had exceeded the trade of 1873-74 by 6·82 per cent. The value of the trade of 1872-73, however, was not reached, the circumstances of that year having been abnormal and having left a depressing effect on the transactions of the years immediately succeeding it.

The imports of merchandise increased considerably on those of the preceding year, while in the imports of treasure there was a large diminution. Under exports both merchandise and treasure showed a great advance.

The trade was divided as follows among the different Continents :—

	Imports.	Exports.	Total.
	£	£	£
Europe - - - - -	34,154,980	36,736,726	70,891,706
Asia - - - - -	6,550,904	19,255,215	25,806,119
America - - - - -	207,406	2,059,489	2,266,895
Africa (including Mauritius and Réunion) -	1,156,240	1,798,229	2,954,469
Australia (including New Zealand and Tasmania) -	343,860	323,610	667,470
Total - - - - -	42,413,390	60,173,269	102,586,659

* Some of the figures for 1873-4 and 1874-5 have been corrected by the Government of India since last year.

The total of the trade with the United Kingdom was 61,146,616*l*. Exports thither increased by 409,383*l*.; while under imports merchandise showed an advance of 1,102,544*l*., and treasure a falling off to the extent of 2,584,707*l*., making a net decline of 1,482,163*l*.

Trade with France increased considerably in both imports and exports. The proportion of imports to exports was only as 1 to 6·79; the figures under this head, however, exclude all the trade which is carried on through England.

The trade with Italy and with Austria again showed a large increase; it has made very great strides since the opening of the Suez Canal.

The total value of the trade which took the canal route during the year was 50·16 per cent. of the whole trade.

The value of the trade of Calcutta with foreign countries and with ports in other Presidencies, so far as it relates to merchandise, is compared below with that of the two preceding years:—

TRADE.
Calcutta.

—	1873-74.	1874-75.	1875-76.
	£	£	£
Imports - - - - -	15,967,530	19,729,843	19,453,452
Exports - - - - -	27,056,457	26,974,414	28,246,597
Total - - - - -£	43,023,987	46,704,257	47,700,049

There was thus, in comparison with 1874-75, a slight decline in the value of the imports, and an advance of 1,272,183*l*. in that of exports. In the interportal trade there was a marked decrease under both heads. A considerable foreign trade has sprung up with Italy and with South America.

The imports and exports of bullion were as follow:—

—	1874-75.	1875-76.
IMPORTS:	£	£
Gold - - - - -	651,540	565,529
Silver - - - - -	2,236,188	514,846
Total - - - - -£	2,887,728	1,380,375
EXPORTS:		
Gold - - - - -	261	67,637
Silver - - - - -	757,920	678,306
Total - - - - -£	758,181	745,943

The following are the chief articles of export and import in which variations were observed as compared with the preceding year, those being first noticed in each case in respect of which there was improvement.

The number of chests of opium exported was 46,768, against 45,704; and the price was higher, as already stated (p. 16). In the value of opium exported to the Straits Settlements there was an increase of 271,213*l*.

The removal of the duty from oil-seeds since August 1875, coupled with very favourable crops, led to a further large increase in the exports under that head. The export of linseed to the United Kingdom alone showed an advance in value of half a million sterling. The export of rape seed rose in three years from 100,000 to 900,000 cwt.

The improvement under food-grains was also most satisfactory, the quantity exported amounting to 5,545,006 cwt. against 3,061,702 cwt. The increase occurred under all the important items. The rice trade showed recovery from the abnormal effects of the famine. But the most remarkable feature was the increase in exports of wheat, which advanced from 279,280 cwt. to 1,330,822 cwt. Almost the whole of this quantity went to the United Kingdom; the bulk of it came from the North-West Provinces.

It was stated in the last Report (p. 52) that the exportation of tea was steadily progressing, and will probably soon rank second to opium. In 1875-76 there was a further satisfactory rise. The United Kingdom received nearly the whole of the exports, more than 24 millions of pounds; this was about one-sixth of the amount sent annually from China, whereas a few years ago the proportion did not exceed one-eleventh. The returns seemed to indicate that

new markets were gradually opening for Indian tea. The trade with Australia does not make the progress that might have been expected, that country receiving her tea supplies more cheaply and conveniently from China.

Indigo showed a large increase in quantity, and also, though not a proportionate one, in value.

There was an actual increase in the exports of raw cotton, over three-fourths of the quantity being taken by China, where there was a partial failure of the crop. But the exports to other countries showed a considerable falling off.

A marked decline appeared in the exports of raw jute, owing partly to increased consumption in the country. A larger quantity, however, was sent away in the manufactured state. There were about 15 jute factories in and around Calcutta. From these factories there were exported beyond sea the enormous number of 50 millions of gunny bags during the past year, which are used for packing the wool of Australia and the grain of all sorts in India, Ceylon, the Malay Straits, Egypt, the United Kingdom, and America. The industry took a spring upwards for packing the rice destined for the distressed districts during the famine of 1874. Subsequently it flagged, causing some loss to those engaged in it, and occasioning temporary depression; but it has since revived, and seems to have gained a hold upon the custom of distant countries. It promises to produce a marked economic and social effect upon Bengal.

In the number of hides and skins exported there was a decrease of 1,727,817.

The export trade in raw silk has been rapidly declining during recent years, owing to bad seasons and bad markets, and a further fall took place in 1875-76. Since the year under review, as already observed (p. 37), prospects appear to have improved.

The tobacco trade was stated in the last Report (p. 53) to be fast rising into importance. It received a check during 1875-76, chiefly in regard to exports to the United Kingdom. There would be no reason to doubt the future progress of this branch of trade if greater care were taken in the preparation of the raw material. The quality of the tobacco will probably never be first-rate, but there is a large demand in Europe for inferior qualities.

Saltpetre showed a falling off, and the exports were considerably below the average of the past five years. Only with France was the trade under this head sustained. In consequence of a statement made in the Bengal Administration Report for 1872-73 that the contemplated introduction of the rules for carrying out the provisions of the Salt Act of 1861 would probably altogether close the saltpetre trade, the Government of India were requested to consider whether the new rules for preventing illicit trade in salt could be in any degree safely modified so as to avoid inflicting what might prove a fatal blow on an apparently reviving branch of industry. The preventive system was introduced in the Patna Division in April 1875, and, contrary to expectation, the manufacture showed signs of improvement. The price of saltpetre, however, fell off about one-half.

The exports of sugar have shown a steady decline for some years past. No explanation of this has been furnished, but it has been suggested that the cause is increased local consumption.

The safflower trade also appeared to be on the decline, which is stated to be a matter of much importance to the cultivation in Eastern Bengal. The demand is apparently affected by the competition of aniline and other cheaper dyes.

Turning now to imports, there was a considerable rise in the trade in silk manufactures, chiefly in low-priced French silks. The trade was partly stimulated by the notion that a favourable opportunity was presented by the Prince of Wales's visit to India.

The importations of metals and of machinery largely increased. The latter is wanted more and more for the cotton mills.

The imports of salt, although they largely increased in quantity, declined in value by 146,107*l*.

The overtrading in cotton piece-goods, mentioned in the last Report (p. 53), was followed by a decline during the year under review in the importations both of cotton twist and yarn and of piece-goods. The trade was also injuriously affected by the unfavourable exchange. Woollen piece-goods, on the other hand, showed improvement.

Under malt liquors and spirits there was a considerable falling off. The increased rate of duty on spirits apparently discouraged the importation of cheap brandies, while the hill breweries have probably supplanted to some extent imported ale.

The imports of coal showed a small decrease, but this was a good sign, being apparently caused by the competition of local production.

Owing to the depressed condition of trade, there was a decrease in both the number and gross tonnage of the vessels which entered the port of Calcutta. With the exception, however, of 1874-75, the tonnage was greater than in any preceding year. The decrease in number was entirely in steamers; the number of sailing vessels was greater. While the total tonnage of the latter also showed an increase, there was a decrease in their average tonnage. The number of Suez Canal steamers entering the port continued steadily to increase.

The trade of the port of Chittagong, after improving steadily for several years up to Chittagong. 1873-74, when it reached a total value of more than one million sterling, has since that year rapidly fallen. During 1875-76 the total value was 588,969 $\frac{1}{2}$. The export trade is confined to rice, and the only article of import worth mentioning is salt, which is received from the United Kingdom.

The value of imports into the Orissa ports was 347,376 $\frac{1}{2}$., and that of exports 327,070 $\frac{1}{2}$. Orissa. This trade has rapidly developed since 1869-70, although in the year under review it was somewhat affected by the fall in the value of rice, consequent on the abundant harvests in Bengal. The large and steady increase in imports of piece-goods and other necessities is a good test of material advancement. The bulk of the trade is interportal.

The new system of registration of the internal river-borne traffic of Bengal came into force on the 1st September 1875. Some difficulties were experienced in getting so elaborate a machinery into proper working order, but they were overcome, and the system is reported to be a great success. It proved beyond doubt the vast extent of the traffic. There are 24 establishments at which the registration is carried on according to a prescribed and uniform practice. Bengal Inland Trade.

The arrangements for the registration of the inland railway traffic were also completed. The existing arrangements on the East Indian Railway are twofold—first, to register in detail the traffic of the most important railway stations with regard to every item of traffic; and secondly, to register in detail the trade in the most important staples of traffic with regard to every station on the line, both within and beyond the limits of the Bengal province. It is believed that under these arrangements registration of all the most important staples of traffic passing between Bengal and the North-West Provinces is thoroughly effected, and that no more complete system can be satisfactorily organised without a considerable increase in expenditure.

The registration of traffic on the Eastern Bengal Railway is comparatively simple, as almost all the merchandise carried is consigned as through traffic to the terminus in Calcutta.

The traffic along the most important roads is likewise now carefully registered.

The following table sets forth the private trade of the port of Madras (exclusive of that Madras. with other ports within the Presidency) as compared with the two preceding years* :—

	1873-74.	1874-75.	1875-76.
IMPORTS :			
Merchandise	£ 5,210,228	£ 5,218,107	£ 5,992,962
Treasure	826,929	871,163	886,508
TOTAL IMPORTS	£ 6,037,157	£ 6,089,270	£ 6,879,470
EXPORTS :			
Merchandise	8,524,458	8,678,532	9,050,677
Treasure	966,969	333,132	316,523
TOTAL EXPORTS	£ 9,491,427	£ 9,011,664	£ 9,367,200
TOTAL TRADE	£ 15,528,584	£ 15,100,934	£ 16,246,670

Excluding re-exports (which amounted in value to 167,422 $\frac{1}{2}$.), the exports of merchandise exceeded the imports by 2,890,293 $\frac{1}{2}$. In the previous year the excess was 3,180,019 $\frac{1}{2}$.

Both imports and exports showed a considerable advance upon those of 1874-75.

There was an increase of 12 per cent. in the imports of cotton twist, and of 6 per cent. in those of cotton piece-goods, which is stated to be possibly in consequence of the lower rates of valuation in the new tariff imparting a stimulus to the trade. In the imports of wines and spirits there was an increase of 39 per cent., notwithstanding the enhancement of the duties by the same tariff. The requirements of the South Indian Railway led to a large increase in the importation of railway stores. The import trade in spices showed the enormous advance of 140 per cent. in value.

Under exports, there was an increase in hides and skins, and in seeds, spices, and oils, and a decrease in indigo. Cotton exports increased, owing to a large demand, and to the favourable prices offered in some places. The exports of food-grains fell, and the imports rose; in these respects there are great fluctuations from year to year according to the harvests, while the cessation of the demand from Bengal also affected the trade in 1875-76.

* The figures given for these years in last year's Report inadvertently included Government stores and treasure.

Bombay.

The private trade of the port of Bombay (including coasting trade with ports beyond the Presidency) is compared in the following statement with that of the three preceding years :—

	1872-73.	1873-74.	1874-75.	1875-76.
IMPORTS :	£	£	£	£
Merchandise - - - - -	14,180,678	14,860,168	15,149,228	17,096,424
Treasure - - - - -	2,868,494	3,436,010	4,730,339	3,643,402
TOTAL IMPORTS - £	17,049,172	18,296,178	19,879,567	20,739,826
EXPORTS :				
Merchandise - - - - -	19,109,139	19,873,499	22,765,502	20,740,321
RE-EXPORTS :				
Merchandise - - - - -	3,474,379	3,461,343	3,455,902	3,736,979
Treasure - - - - -	1,666,545	1,253,120	1,061,099	1,559,932
TOTAL EXPORTS - £	24,250,063	24,587,962	27,282,503	26,037,232
TOTAL TRADE - £	41,299,235	42,884,140	47,162,070	46,777,058

The total was thus about 385,000% less than that of the preceding year, though the recovery from the depression of 1872-73, when the trade fell by 8,693,861%, was still maintained.

The increase of imports was partly due to the Prince's visit, but, owing to the adverse rates of exchange, they are believed not to have been profitable. Excluding treasure, the value of exports was to that of imports in the ratio of 6 to 5. In exports there was a decrease. The excess of exports over imports was only half of what it was in 1874-75.

The returns were also affected by the ruling market values of certain dutiable articles having been substituted for the tariff values.

The amount of import duty collected was 621,011%, which gives a per-centage on the value of the import trade of 3.63. Export duty amounted to 34,362%, the per-centage being .164.

In transactions in treasure there was a decrease to the extent of 588,104% of which 325,562% was in gold, and 262,542% in silver. The derangement in the silver currency continued seriously to affect the exchange.

The distribution of the imports and exports of merchandise was as follows :—

	Imports.	Exports.	Re-Exports.
	£	£	£
United Kingdom - - - - -	9,666,109	9,032,918	
France - - - - -	208,643	1,955,012	
Other parts of Europe - - - - -	301,135	2,016,272	
China - - - - -	1,309,243	5,702,505	
Arabia and Persia - - - - -	466,844	375,947	
North America - - - - -	58,194	101,956	
Other places beyond India - - - - -	1,462,270	530,138	
Total of Foreign Ports - £	13,472,438	19,714,748	1,646,141
British Ports in other Presidencies - - - - -	2,458,728	755,181	1,752,525
Foreign Indian Ports - - - - -	1,165,258	270,392	338,313
	£ 17,096,424	20,740,321	3,736,979
Total - - - - -		£41,573,724	

It will be seen that the exports to China, North America, France, and the rest of Europe exceed in value the imports from those places; whereas the imports from the United Kingdom, Arabia, Persia, and other places beyond India, exceed the exports.

Turning now to some particular items of trade, in the value of cotton piece-goods imported there was a total increase of 361,955%, but it occurred entirely in the finer description of

grey fabrics, and in white and coloured piece-goods, which were required by the exceptional circumstances of the year. The imports of grey-shirtings, long-cloths, T-cloths, domestics, and sheetings fell off considerably, owing to the competition of local manufactures. Of 4,652,423*l*. (the total value of the imports), 3,494,118*l*. represented imports from the United Kingdom alone, the rest coming chiefly from Trieste, Genoa, and Venice. The value of re-exports was 931,630*l*., and they were chiefly to Eastern Africa, Aden, Arabia, Persia, the Straits Settlements, and Asiatic Turkey.

There was also an increase in the exports of country-made piece-goods from 247,795*l*. to 315,833*l*., but this increase was not so large as had been expected from the greater number of mills. The great bulk of the increase was in fancy goods of hand manufacture.

Under cotton twist and yarn there was a decrease in imports to the value of 167,522*l*. The difference in quantity was not proportionately so great, which is accounted for by the technical difference in the mode of registering values already referred to. The increase was chiefly in lower numbers, as also in coloured yarns, and was due to the operations of the local mills; in the higher numbers of both mule and water there was an increase. The re-exports amounted to rather more than 9 per cent. of the imports, and were principally to Persia and Aden.

The exports under the same head showed a large increase in value, viz., 142,664*l*. This occurred mainly in exports to China and Japan, where the country twist is said to be in particular favour.

Under raw cotton there was a falling off in both imports and exports. In the former case it occurred in the coasting trade, being due to less importation from Kutch and Kattywar. In exports the decrease was very great, amounting to 2,696,219*l*. in value, and took place for the most part in those to the United Kingdom, France, and Trieste. Those to Russia, China, and Italy showed an increase. Cotton was sent to Belgium, Holland, and Spain, to which countries there had been no exportation in the previous year. The reasons assigned for the diminished export trade of the year are the short crop, increased consumption for local mills, and lower prices in England.

The wheat trade appears to be very capricious. The exports to the United Kingdom showed the enormous increase of 178,156*l*., owing, it is believed, to the apprehensions of a bad harvest at home at the commencement of the year. The trade with France fell off one-half, while that which had just commenced with Trieste did not maintain its promise, the value of the exports falling from 13,225*l*. to 2,987*l*. On the whole, there was an increase over the exports of the previous year of 61,497*l*.

The trade in oil-seeds was greatly stimulated by the abolition of export duty and by the reduction in the cost of carriage by railway. Notwithstanding lower prices at home, the value of the exports rose from 604,177*l*. to 1,759,833*l*.

The falling off under opium, and the reason for it, have already been stated (p. 17).

The consumption of tea appears to be steadily increasing. The value of the imports during 1875-76 was 211,593*l*., against 106,940*l*. in 1874-75. The brisk demand at the close of the last-mentioned year led to large importations of inferior quality from China. Next to that country, the principal portion in 1875-76 came from Ceylon and the Straits Settlements.

In exports of coffee there was an increase of 16,587*l*., of which Turkey in Asia and France took the greatest part.

The following figures show the effect of increased local industry on the requirements for machinery :—

	Value of Imports.
	£
1871-72	126,826
1872-73	236,793
1873-74	355,449
1874-75	519,702
1875-76	742,165

The latter figure represents an importation six times as great as that of 1871-72.

The steady advance in importations of clocks, watches, matches, and umbrellas shows how these articles of domestic use are coming into favour in India.

There was an increase under every head in the number of vessels entered at and cleared from the port of Bombay. In the case of steamers, the increase in number was 112, and in tonnage 71,268 tons. Government having purchased the reclamations on the foreshore known as the Elphinstone Estate, and handed over the property to a Port Trust, the latter obtained sanction for the construction of wet docks, which will be known as the "Prince's Dock,"

the first stone having been laid by the Prince of Wales on the 11th November 1875. The dock will have a draught of 25 feet, and an open channel to the deep water in the harbour will be capable of berthing the largest vessels visiting the port. The docks are estimated to cost about 750,000*l.*, and are already well advanced; they will supply a need long felt at Bombay.

Sind.

In the foreign trade of the Sind ports, private imports increased from 291,504*l.* to 345,660*l.*, and exports from 1,081,685*l.* to 1,719,888*l.* The total foreign and coasting trade (private) showed an advance from 3,633,549*l.* to 4,637,406*l.*

Excluding interport trade among ports within the province, the import trade (foreign and coasting) increased by 263,600*l.* The principal items in which the improvement occurred were cotton piece-goods, sugar, &c., provisions, coal and coke, copper, and raw cotton. The increase under piece-goods would have been greater than it was but for diminished imports from the United Kingdom. The chief decreases were in railway material, spices, grain and pulse, and jute manufactures.

With a similar exclusion of interport provincial traffic in the case of the export trade, the latter exhibited an increase of 765,424*l.*, of which 638,204*l.* was in the foreign trade. The increase took place principally in rape-seed, raw wool, raw cotton, wheat, indigo, &c. Under seeds the exports of the preceding year were about doubled, the difference in value being 308,419*l.*; the increase under raw cotton was 145,104*l.*, arising principally from larger exports to Hong Kong. It has been above stated that in exports of wheat to France from Bombay there was a great falling off; the exports from Sind to that country showed, on the other hand, an increase of about 235,000*l.*

The increase in steamers in 1875-76 was 42 entering and 49 clearing from Sind ports, and is accounted for by the large increase of trade *via* the Suez Canal, and by the running throughout the year of bi-weekly mail steamers between Kurrachee and Bombay, and of weekly steamers to the Persian Gulf.

Punjab.

The new system of registration in the Punjab, which was mentioned in last year's Report (p. 57), was continued and improved in 1875-76. After correcting certain errors and omissions in the returns for 1874-75, the trade of the two years may be compared as follows:—

	1874-75.	1875-76.
	£	£
Imports	12,666,350	12,598,165
Exports	6,879,049	5,879,793
	<u>19,545,399</u>	<u>18,477,958</u>

Thus a decrease appeared in the latter year in the imports, and a much greater one in the exports. The latter was partly owing, it is believed, to the traffic of the Indus Steam Flotilla having been placed at too high a figure in 1874-75, but mainly to diminished exports of food-grains, for which in the two previous years the famine in Bengal had created an extraordinary demand. The decrease in the imports was due to the decline of the shawl trade; under all other heads there was a considerable increase. The imports of oil-seeds were double those of the previous year, and the exports rose in quantity from 331,620 to 881,164 maunds. Both the import and the export of tea increased considerably.

In the Report of last year (p. 57) the exports of cotton piece-goods were put down as of Indian manufacture, but it subsequently appeared that 95 per cent. of them were European fabrics.

Oude.

During the year ending 30th September 1875, the value of imports into Oude was 1,768,133*l.*, against 1,732,002*l.* in the preceding year; and that of exports 1,331,988*l.*, against 1,352,866*l.* Thus, while imports increased by 36,131*l.*, exports decreased by 20,878*l.*; and the excess of imports over exports was 436,145*l.*

Imports of cotton increased by 48,290*l.*, and of English piece-goods by 35,780*l.* In the imports of country cloth there was a decrease.

The quantity of wheat exported was more than doubled as compared with the preceding year, but in the export of other food-grains there was a decrease.

Ajmere.

The opening of the railway to Ajmere has resulted in the greatest benefit to the trade of that town, all intermediate transit dues and similar exactions being avoided, and traders being enabled to deal directly with importers.

There was a material improvement during 1875-76 in the trade of the two towns of this district. The import of grains was nearly doubled. In the importation of cotton piece-goods

there was a considerable falling off as compared with the two preceding years, which is attributed, in some measure, to the overstocked state of the market. There was a large export of cotton piece-goods, consequent on the increase of local manufacture.

Compared with the previous year, the total exterior traffic of the Central Provinces shows an advance in value from 7,890,417*l.* to 8,113,619*l.* The figures were the highest on record. Central Provinces.

There were increased exportations of wheat for shipment to England and the Continent; the value was 337,667*l.* The trade in this article is stated to be capable of almost indefinite expansion. Information of the requirements of the European market as to the wheat being unmixed with pulses and each description of wheat being kept separate was widely circulated among local growers and exporters.

There was almost double the usual export of oil-seeds. On the other hand, in the export of cotton there was a very large decrease, owing to a deficient crop and low prices.

The trade of British Burma during 1875-6 suffered much depression from political causes, namely, the rumours of complications with Upper Burma, and the intended mission of Sir D. Forsyth. The sea-borne export trade, however, retained its vitality. Under imports, cotton piece-goods decreased in value by 44 per cent., and twist and yarn nearly 40 per cent. British Burma.

Adding to the foreign trade in merchandise that with ports in the Indian peninsula, the figures stand as follows:—

	1874-5.	1875-6.
	£	£
Imports	4,130,940	3,262,174
Exports	4,661,177	4,986,598
Total	£8,792,117	£8,248,772

The bulk of the foreign trade is with the United Kingdom; next in importance come the Straits Settlements, Singapore being the emporium for the China trade.

The following was an approximate estimate of the value of the trade with Thibet through Sikkim during the year:— TRADE WITH THIBET.

	£
Imports from Thibet	11,063
Exports to ditto	18,554

To the former must be added jewellery, ornaments, and coined silver, regarding which trustworthy figures were not obtainable.

In last year's Report (p. 60) mention was made of Mr. Russell's caravan as abnormally swelling the trade with Turkestan in 1874. If the value of that caravan (31,000*l.*), and that of the return imports to the end of 1875 (3,000*l.*), be put out of account, the comparison between the trade of the two years, as registered at Leh, will appear as follows:— TRADE WITH EASTERN TURKESTAN.

	1874.	1875.
	£	£
Imports from Turkestan	38,180	34,270
Exports* to ditto	35,166	45,444
Total	£73,346	£79,714

There was thus a decrease in the imports to the extent of 3,910*l.* This is attributed to three causes. The first is the decreased import of gold dust consequent on the restrictions put on the purchase of gold since the establishment of a mint in Kashgar in 1874. The unsettled state of Kokand may also have had some injurious effect on the trade. But the principal disturbing cause was doubtless the enterprise above referred to, which had temporarily glutted the Yarkund market, thus obviating the necessity for the despatch of goods to exchange for Indian productions.

Under exports there is shown an increase of about 10,000*l.*, and the net increase of the whole of the normal trade was 6,368*l.*

* The figures given under this head are in reality those representing the value of imports from British India, which are in the main identical with exports to Turkestan. The actual value of the latter during 1874 was 14,090*l.* in excess of imports from India, owing to a large quantity of goods having remained over from 1873 in the Leh market, so that a comparison of the actual exports of 1874 and 1875 would convey a false impression.

While the prospects of a moderate amount of business were on the whole encouraging, it was more than ever apparent that quick returns cannot be looked for in commerce with Yarkund. One great impediment lies in the difficulty of carriage. The year under report was marked by the successful completion of the Lachalang Road from the Tsarap river to the top of the pass (*see* last Report, p. 46). The Shayok Valley was also surveyed with a view to opening a new route *via* the Shayok river to the Karakorum pass, but the estimated cost has necessitated the abandonment of this project for the present.

Of the total Indian exports to Yarkund cotton piece-goods represented 32·5 per cent., against 24·3 per cent. in the previous year; and a gradual expansion of the demand for this class of goods is apparent. The aggregate value of these exports during the four years 1868–71 was 25,278*l.*, while during the subsequent four years it was 59,129*l.* English fabrics are sold to some extent by Russian merchants in Kashgar.

There is a great demand for tea in Yarkund, where it is as much a *sine qua non* as opium is in China, and there are indications that the Indian market will be more extensively drawn upon than heretofore. It will be desirable, however, that our merchants should cater to the Yarkundi taste in the preparation of their teas. Green tea is universally preferred to black, and, generally, a strong and pungent tea to one more delicately flavoured. It is also considered that it would promote the sale if the tea were packed in the form of bricks. A large quantity of Lhasa brick tea found its way to Yarkund during the year, but this tea does not find much favour there owing to its peculiar taste.

TRADE
THROUGH
LADAKH.

In addition to the trade with Eastern Turkestan, a considerable amount of traffic with Chinese territory and with Cashmere passes through Leh.*

	£	
*Changthan { Imports	- 17,577	The value of the total imports at Leh (excluding Mr. Russell's caravan) was 110,051 <i>l.</i> , against 94,960 <i>l.</i> in 1874. The local exports from Ladakh in 1875 were of the value of 1,182 <i>l.</i> , but the corresponding figure for 1874 is not shown separately in the returns. Adding together imports and local exports, the value of the trade through Ladakh in 1875 is set down by the Punjab Government as 111,233 <i>l.</i> †
{ Exports	- 12,113	
Cashmere { Imports	- 12,759	
{ Exports	- 15,231	

† As the imports into Leh may happen to be heavier in some years than the exports, and as, owing to goods having thus accumulated at Leh, the exports may afterwards exceed the imports, the Government of India think that, to estimate the real value of the trade of Ladakh for any year, the most correct plan is to take the average of the imports and exports of the transit trade and add thereto the value of local exports. Thus calculated the trade of 1875 would stand at 109,221*l.*

X.

PUBLIC HEALTH AND SANITATION.

The total death-rate in the European Army of India during 1875 was 17·48, or, excluding EUROPEAN ARMY. cholera, 14·16 per 1,000. In 1874 the rate was 13·58 per 1,000, the lowest that had ever been recorded.

The year 1874 had been remarkable for the general immunity from cholera; among British troops there were only 12 cases. In the succeeding year the disease prevailed as an epidemic throughout the country. The cases in the European Army numbered 288, and the deaths 194. The ratios compared favourably with those of former epidemics.

In the whole Army only 12 cases of small-pox occurred, of which two were fatal.

Numerous sanitary works were executed during the year for the benefit of the European troops. The system of dry-earth conservancy maintained its reputation for thorough efficiency when properly carried out. Special attention was given to the sanitary supervision of villages in the neighbourhood of cantonments.

In the Bengal Native Army the sickness was less, and the mortality greater, than in 1874. NATIVE ARMY. Bengal. Malarious fevers and bowel complaints caused a large proportion of the sickness. An unhealthy condition prevailed very generally among the sepoys, induced apparently by insufficiency of diet. The food available for them was, as a rule, plentiful, cheap, and of a good quality, but, from motives of parsimony, and in a few cases also in consequence of a religious vow, underfeeding was very common.

Of 132 cases of cholera, 58 were fatal. Only 34 cases of small-pox were treated, showing that the men were well protected.

It was found that marching and camp life produced a most beneficial effect on the health of the men. Tree-planting was also much resorted to, experience having shown that trees planted with certain precautions prove advantageous to health by preserving the purity and increasing the moisture of the atmosphere, as well as by protecting from extremes of temperature, and affording a grateful shade by their foliage.

The conservancy of cantonments and regimental lines, and of latrines, appears to have been carefully attended to. The water-supply in general was abundant and of fairly good quality.

Considering the great prevalence of cholera amongst the civil population in 1875, it is Madras. remarkable that in the Madras Native Army there were but 88 seizures, and 34 deaths. As some of the regiments were quartered in stations in which the disease was very prevalent, such an immunity could not be considered as merely fortuitous, but it was probably due in a great measure to the various sanitary improvements which had been carried out in the lines, and to the care exercised over both men and followers during the prevalence of an epidemic.

Malarial fevers and lung diseases produced the largest number of deaths, and next to these came bowel complaints.

Great attention was paid to conservancy of wells, and the water-supply was generally favourably reported on.

During the four years 1872 to 1875 there was a progressive annual diminution in the Bombay. statistics of sickness in the Bombay Native Army, showing apparently that the measures taken to preserve the health of the soldiers have borne some fruit.

The mortality of 1875, however, was greater than that of 1874; the principal cause of this was the epidemic of cholera which prevailed amongst a portion of the troops.

As in the other Presidencies, malarious fevers were the principal cause of sickness.

Vaccination was thoroughly carried out, and only infants of tender age remained unprotected. There were no deaths from small-pox.

The supply of water was reported good and abundant; many of the waters were analysed, and some improvements made. The lines everywhere were kept clean, and the conservancy and sanitary arrangements, as carried out by cantonment committees, were generally satisfactory.

The system of registration in selected areas was continued in Bengal, but the figures HEALTH OF GENERAL POPULATION. Bengal. cannot, it is stated, be accepted as even approximately correct. They varied only slightly from those of the two preceding years. Some measures were determined on with a view to the improvement of general registration.

A census was taken of the town of Calcutta in April 1876, on the basis of which the death-rate of that town for 1875 would be 35·08 per 1,000.

No single district in the province escaped altogether from cholera, and in some the disease

was in operation all the year round. More than one-fifth of the total mortality was attributed to this cause.

Small-pox was also present in every district. It was, on the whole, very mild in character, and considerably less fatal than in 1873 and 1874. Only 5,280 deaths were reported to have occurred in 1875, against 10,933 and 12,056 in the two preceding years.

On the whole, fever was marked by diminished severity. By far the largest proportion of the fever of this province is of malarial origin, and the specific fevers of Europe are seldom met with or recognised except in Calcutta and its neighbourhood.

Madras. The year was characterised in the Madras Presidency by a prolonged and trying hot season. The rainfall was at the same time below the average, and very much less than in 1874. The most notable result of these peculiarities was a deficient supply of potable water, and this, combined with the depressing influence of a long sustained high temperature, had an injurious effect on public health, which was also greatly disturbed by a very severe epidemic of cholera, and by the prevalence of small-pox and fever.

Deaths from cholera numbered 94,657. Small-pox was universally diffused, but the number of deaths (24,787) was less than in any year since 1871. Fever deaths amounted to 252,131; the mortality from this cause is said to have been increasing year by year since 1868. Under bowel complaints 37,613 deaths were registered.

Bombay. In Bombay there were 47,555 deaths from cholera among the civil population, out of 96,012 attacked; in the previous year there had been only 37 deaths.

The fever deaths were 219,156 in number, exceeding those of any past year of registration.

Punjab. The total number of deaths registered in the Punjab was 130,495 in excess of the number in 1874. The great bulk of the increase was under the head of fevers, to which 279,841 deaths were assigned, being 89,210 more than in the preceding year. There was an enormous mortality from remittent fever. Deaths from bowel complaints increased from 16,407 to 27,550. The cholera mortality stood at 6,246, against 78 in 1874. Under small-pox there was an advance from 12,026 to 13,594 deaths; compared with 1873, however, the mortality from this cause continued to show a remarkable diminution, which is distinctly traced by the authorities to the effect of vaccination.

North-West Provinces. Cholera prevailed in all parts of the North-West Provinces except Jhansi and Lalitpur in the south and Kumaon in the north.

The mortality from small-pox fell from 93,247 to 25,819. The usual great mortality was recorded from fevers. Bowel complaints were the cause of 80,337 deaths, against 60,865.

Oude. The cholera deaths in Oude, which in 1874 had numbered 68, rose in the year under report to 23,321.

Small-pox occasioned 5,612 deaths, being 9,618 fewer than in 1874. The decrease is probably due in part to defective registration, and in part to the fact that every great epidemic is followed by a lull, the number of possible victims being reduced by previous years' outbreaks. Vaccination has made too little advance to receive any of the credit.

Central Provinces. The mean death-rate of the Central Provinces was returned as 26·32 per 1,000, being an increase on the rate for the previous year of 2·83. The increase was the result chiefly of the great prevalence of cholera and small-pox.

In the course of the five years intervening between 1869 and 1875 cholera had been very slight and limited to small areas, but in 1875 it became widely prevalent, and although the mortality it occasioned was not so great as in 1869, cases occurred in every district of the province with the exception of Damoh.

Berar. Cholera was more general and more severe in Berar than in any other province of India; the deaths from this cause numbered 22,465. No efforts were spared to alleviate the sufferings of the people and to check the spread of the disease.

The small-pox deaths numbered only 927, being fewer than in any year since 1871. There were 26,076 deaths registered under fevers, and 20,818 under bowel complaints. The mortality from the latter cause continued to hold its high place in this as compared with other provinces.

British Burma. In British Burma there were only 761 deaths reported from cholera, which did not assume an epidemic form anywhere but in the town of Bassein.

The mortality from small-pox was only 752, as compared with 1,191 in 1874, and 1,416 in 1873, and it was less than during any previous year of which there is a record. In no case did it assume an epidemic form; the greatest number of deaths was in March, at which season the inoculators do the greatest part of their work, and the lowest number in November. Vaccination contributed in some degree to the comparative immunity of the province from small-pox, the improvement being marked wherever an interest was taken in the work.

It is conclusively shown by the Sanitary Commissioner for Bengal that the mortality from small-pox was highest in the towns and districts in which inoculation was practised, and was lowest where the Act prohibiting inoculation was in operation. VACCINATION.
Bengal.

The practice of inoculation is stated to be hedged round by religious rites and ceremonies rendered sacred by the practice of ages. Again, inoculators from other parts, knowing how the minds of the people are disposed, step in and supplant the ex-inoculators in the villages where their forefathers have practised before them, and as a consequence the ex-inoculators are compelled to revert to the old system rather than suffer in their means of livelihood.

In the province of Bengal there were 988,858 persons vaccinated, being an increase of 29,185; in some circles the increase was considerable, while in others there was a marked falling off. The total was vastly less than that required for the protection of the population; the results achieved, however, in the opinion of the Government of Bengal, continue to afford just grounds for encouragement.

There is stated to have been less difficulty than formerly in persuading the people to accept vaccination.

There was a slight improvement in the number of females vaccinated. On the other hand, in the number of infants there was a falling off; the parents are said to be prejudiced from their experience of the risks of inoculation.

The ratio of success in primary cases was 97·2 per cent., against 96·53 in the preceding year.

In Madras there was a considerable falling off both in the number of operations and in the ratio of success; the former was 381,412, and the latter 93·89 per cent. The prevalence of cholera is said to indispose the people to submit themselves or their children to vaccination; while, further, the employment of vaccinators in many districts as distributors of cholera medicines appears to have interfered with their proper work. Madras.

Vaccination in the Bombay Presidency was considerably extended, and at a comparatively less cost than in any of the seven preceding years. The number of operations was 808,353. There were 22,573 more infantile vaccinations than in 1874-75; the whole of the increase (18,822) in primary cases having been among infants. The per-centage of success in primary operations was 97. Bombay.

The total number of vaccinations performed in the Punjab during 1875-76 was 440,394, which showed a considerable falling off. Punjab.

Although opposition was generally diminishing, it was very strong in some parts. In the Delhi district it was frequently met with, but was overcome. In the large town of Panipat the people had formerly been violently opposed, but, through the able assistance of the tahsildar and the municipal committee, over 1,000 children were vaccinated, a good many of whom were Rajpoots. In the city of Kurnool nothing could be done for several days, but eventually about 600 children were operated on; here some of the members of the committee showed a very bad example by sending their families away. In many parts of the Umballa district the vaccinators were gladly welcomed. There was decided improvement in the district of Umritsur; in the city some members of the committee gave excellent help, while others were either indifferent or opposed; indeed, out of 36 only 5 took any interest in the work. Much opposition was encountered in the Ferozepore district, chiefly where the Sikh element predominated. In Peshawur city the work proceeded far more satisfactorily than formerly.

In the districts south of the Sutlej, where the Hindoo element greatly preponderates in the population, the prejudice against vaccination is very strong, and there the mortality from small-pox continued great. In the district of Gurgaon, in which Sitla, the goddess of small-pox, has a famous temple, no less than 2,741 small-pox deaths were registered. In Jullundur, Gurdaspur, and other districts the people have become so sensible of the advantages of vaccination that it is not uncommon for them to petition the authorities to send vaccinators for their children. In these districts the small-pox mortality was trifling.

The Superintendent-General in the North-West Provinces observes that the people have to pass through three stages upon the introduction of vaccination; the first, that of terror, when the mothers hide their children in the fields on the approach of the vaccinator; the second, that of apathy or mild dislike; the third, that of a belief in its efficacy. Kumaon perhaps may be said to have arrived at the third stage; Rohilkund to be passing into it; and the other three circles to be still in the second stage. The first stage, he thinks, has been finally left behind everywhere. North-West
Provinces.

In 1874-75 the number of vaccinators in the province was 401, and the number of persons vaccinated was 494,928. In 1875-76 the number of vaccinators was 453, and they performed 529,207 operations, being an increase of 34,279. It is satisfactory to notice that the increase occurred chiefly among the high-caste Hindoos.

Oude. In Oude the number of operations was 27,656, and the ratio of success 84·47 per cent. The Natives are reported to be thoroughly opposed, and their minds do not appear to be becoming more enlightened in the matter.

Central Provinces. The number of operations in the Central Provinces was 222,633, being 23 per cent. above the number of the previous year. Among the primary cases the ratio of success averaged 95 per cent. The high ratio of success in secondary cases (71·4 per cent.) appeared to show that a considerable portion of the adult population was not protected. The effect of vaccination in reducing the mortality from small-pox was evident in certain districts.

British Burma. The year showed some progress in British Burma in regard to vaccination, but not such (the Chief Commissioner observes) as might well have been achieved had ordinary diligence and activity been exercised.

The people of Burma have a very great prejudice against inoculating or vaccinating infants; children under one year old are seldom or never inoculated, although, on persuasion, they are allowed to be vaccinated. Against vaccination itself they have no deep-seated prejudice, but they regard it as a weak form of inoculation, and are not satisfied when they see that it is not followed by vesicles scattered over the body, but that the eruption is confined to the points of insertion. The inoculators of course persuade them that it is not equally efficacious, because, if vaccination *gratis* became general, their fees would cease; and their emoluments are chiefly derived from the after treatment of the disease which they originate.

HOSPITALS AND DISPENSARIES. Bengal. The number of charitable hospitals and dispensaries in Lower Bengal at the close of 1875 was 207. Two were closed and six new ones opened during the year. These figures do not include the temporary institutions in the Burdwan, Beerbhoom, and Midnapore districts.

The advantages afforded in the medical schools and colleges of Bengal to those studying medicine are stated to be gradually attracting a superior class of students, which will have a favourable effect on the future management and usefulness of dispensaries. The institutions appear to be steadily growing in favour with the people.

The proportion of income derived from local funds increased from 19·93 to 27·82 per cent. The subscriptions from Europeans rose from 2,386*l.* to 2,528*l.*, while those from Natives fell from 10,833*l.* to 10,569*l.* The financial position of the institutions generally was very satisfactory.

Bombay. All the officers employed in charge of the Bombay institutions are reported to have worked well and zealously.

In contributions for dispensaries from local funds there was a creditable increase, as also in private subscriptions; but municipal contributions showed a considerable falling off.

While the statistics show that 1875-76 was a very unhealthy year, they also prove that the dispensaries did excellent and useful work, and were much appreciated by the sick poor.

Punjab. The statistics for the Punjab for several years past show a steadily increasing appreciation of dispensaries, and confidence in the European method of treating disease. The number of institutions rose in 1875 from 136 to 150; in 1874 there had been an increase of 16.

The attendance at the whole of the institutions aggregated 1,037,835, being an increase of 143,568, and this increase was among all classes.

The contributions from all sources increased; those from municipalities by 4,238*l.*, from Europeans by 119*l.*, and from Natives by 186*l.* Towards the completion of new wards in the Delhi dispensary 430*l.* were contributed by the Native residents of that city; of this, 200*l.* was received from the representative of one gentleman who had bequeathed a large sum to be expended on objects of charity. This dispensary also receives liberal support from a wealthy citizen, Lala Mehr Chand, who supplies food and country medicines to a certain number of indoor patients.

Oude. In Oude there was a satisfactory advance in the number of patients. The institutions are shown to be gradually gaining favour with the people. That their popularity depends in a great measure on the demeanour of the medical practitioners was illustrated in the case of the Sitapur dispensary, which stood low in the scale of usefulness, owing to the brusque manner of the Native assistant-surgeon, until, during the last three months of 1875, it rose, under the medical charge of another officer, to head the list; the total applications for relief during 1875 were 11,186, against 7,743 in 1874.

British Burma. A considerable increase in attendance in British Burma is stated to be due, not to increasing unhealthiness of the country, but to the growing confidence of the people in the efficacy of European medicines.

The progress of the dispensary in the Northern Arakan Hill Tracts was most satisfactory, the patients having increased from 404 to 1,441.

The steady progressive increase in the asylum population of Bengal has attracted serious attention. Since 1868 the average yearly increase has been 62·5. The Government of India have issued instructions to the effect that probably many of those in confinement would be better with their friends, and that asylums should be reserved only for criminal lunatics, lunatics who are absolutely dangerous, and those who, having no friends or belongings, may be in the acute stage, in which there may be the greatest hope of recovery. In the carrying out of these orders, the Government direct that care be taken to ascertain that harmless lunatics left in the charge of their friends are not maltreated or subjected to any objectionable restraint; while every facility will be given for the reception of such persons in asylums, provided the relatives are willing to pay for them such rates as will entirely cover all charges incurred on their behalf.

LUNATIC
ASYLUMS.
Bengal.

The admissions in 1875 were apparently from the most impoverished and necessitous classes of the community; of the total, 79·42 per cent. were males.

Reviewing the results of the year generally, the Surgeon-General remarks that they could hardly have afforded more positive evidence of the favourable conditions in which the insane under treatment have been placed, whether for the cure of their mental derangement by skilled attention to every detail, or for lessening the hardships of their sad lot by gentleness and kindness.

In the asylums of the Madras Presidency (three in number) the per-centage of recoveries increased from 45·29 to 51·97, while the mortality decreased from 14·50 to 11·27, as compared with the preceding year.

Madras.

At the Madras asylum outdoor labour for the patients was largely resorted to with manifest advantage, and at the same time a great deal of useful work was done in the way of gardening, cleaning, and sweeping the grounds, drawing water, and repairing roads, hedges, and drains. Various indoor industrial pursuits were also attempted, and the superintendent hoped to be more successful in these in future. The band of one of the corps in garrison was permitted to play in the asylum grounds once a fortnight, and some of the patients seemed to thoroughly enjoy the performance. The usual Christmas dinner was given; and, owing to the liberality of subscribers for this treat, the superintendent was able to add to the pleasures of the day by introducing jugglers, Native dances, fireworks, and illuminations. The library was kept in good order, and various books were added to it during the year. Similar remedial measures were also adopted at the other institutions.

The health of the lunatics at the Delhi asylum was, on the whole, good, and although cholera prevailed in the city and neighbourhood of the asylum from the beginning of May to the end of November, no case occurred in it.

Punjab.

The following account is given of the diversions supplied for the patients: "Every inducement is given to the lunatics to amuse themselves in any way they can, and for this purpose kites, toys, tom-toms, sitters, &c., are provided for those who care for them. The women have pet pigeons, rabbits, and lambs; swings are also erected for their amusement. On Sundays all are treated to either sweetmeats or fruits in their season. This treat is looked forward to by them, and in cases of misbehaviour it is withheld as a means of punishment."

The lunatics are freely indulged in tobacco at certain hours daily, and their friends are permitted to visit them as often as they wish. On the whole they are said to be as happy as their miserable state will allow.

No manufactures have been attempted, but the males were employed in gardening, in keeping the ridges and walks neat and trim, and in any other light labour to which they could be induced to turn their hands. The women do a little spinning of cotton thread, &c.

Cleanliness and conservancy are reported to have been fairly looked after. While it is impossible that these should be so rigidly attended to as in a jail, owing to the extremely filthy and irregular habits of many of the inmates, both barracks and latrines are as far as possible kept clean and free from smell.

At the Lahore asylum, too, gardening is the chief occupation. There are three or four rooms for weaving common cloth, but all attempt to increase labour in this direction involves too much loss to Government.

The value of occupation and amusements in the successful treatment of insanity is well borne in mind at the Rangoon asylum. It is stated that many of the articles in the workshops are excellent samples of skill. A beneficial and tranquillising effect is produced on the patients by the efforts that have been made to render the surroundings more homelike and of more individual interest. The recreation ground, where the excited and violent male patients take exercise, and which was formerly a bare uninteresting spot, was during the year carefully laid out, levelled, and turfed, and the walks were planted with shrubs. The improvement in the demeanour of the patients attracted, it is said, the comment of all who were familiar with it.

British
Burma.

**MEDICAL
SCHOOLS.
Bengal.**

The medical schools in Bengal were five in number, new schools at Dacca and Cuttack having been opened during the year. Except in the English department in the Medical College, the instruction in all these schools is given in the vernacular. The Dacca school was well attended, and promised to be a very useful and popular institution. The Cuttack school is intended to supply a want which has for some time been felt, owing to the distance of Orissa from the higher educational institutions of Bengal.

Madras.

The reports of the Madras Medical College for the sessions 1874-75 and 1875-76 were very favourable. The success that attended two ex-students (British) in competing in England for the Indian Medical Service affords additional testimony to the sound teaching and training that have for so many years distinguished this college. It is, however, regretted that the advantages offered by the college do not draw a larger number of students. The insufficient knowledge of English possessed by the Native pupils is another subject of regret.

The Madras University has instituted a new degree of Licentiate of Medicine and Surgery, which, from involving a less demand than the present degrees upon the time and previous education of the students, will, it is believed, attract a considerable number of candidates. Young men desirous of qualifying for the L.M. degree will have to undergo a course of professional training at a recognised school of medicine to extend over a period of four years, or else one year's training at a hospital or dispensary and three years at a medical school.

**North-West
Provinces.**

An experiment which had been made in the North-West Provinces for the training of female Native doctors having been proved to be a failure, orders were given during the year under report for the closing of the school established for that purpose at Bareilly. Dr. Corbyn, to whose exertions the existence of the school was due, himself pointed out in the following words the reasons for abandoning the attempt:—

“ Another year's working of the school obliges me to confess that, while the European and Eurasian pupils have more than fulfilled my expectations, I feel more strongly than ever the obstacles in the way of utilising the Native ones; not that they do not learn quickly and intelligently, for indeed their progress is remarkable, but when they are sufficiently educated to act independently, they do not seem to command the same confidence and respect that the European women do; Native prejudices regarding the sex hamper them at every step. If they go out into the world unmarried, they are looked down upon, and all sorts of difficulties arise as to whom they are to live with. On the other hand, if they are married, the chances are the husband will insist on their being entirely engaged on household duties, and will object to their pursuing the calling for which they have been fitting themselves.”

Oude.

Several dismissals took place during 1875-76 in the Bulrampur school for carelessness and inaptitude to learn the medical profession. The Principal says that greater strictness will have to be used in future in admitting candidates, though of course it is not easy to ascertain what a lad will turn out before he is tried.

On the whole, the Principal was not dissatisfied with the first batch of students who had just terminated their curriculum. Many of them came from illiterate classes. They were very imperfectly trained to start with, and they were therefore unacquainted with the simplest facts of science. They had not only to understand and remember innumerable facts in various branches of the complicated medical course, but also to learn and remember a vast number of new terms foreign to their own language. The professors, he adds, did their duty with zeal, and spared no pains in teaching the students.

**SANITATION.
Bengal.**

Progress in the sanitary improvement of towns in Bengal continued, and, though few very large and costly works were undertaken of a purely sanitary character, there were signs everywhere of activity in promoting minor improvements in connexion with drainage, water-supply, conservancy, &c.

The municipal income of towns is very small, and considering the demands which have to be met as first charges against it, such as maintenance of police, making and repairing of roads, lighting, &c., there is but a small balance left, even in the more flourishing towns, for new works.

The Calcutta Municipality obtained a loan from Government for proceeding with the completion of the drainage of the town according to Mr. Clark's scheme.

An important sanitary measure of the year was the appointment of a health officer for the Port of Calcutta. The duties of the office are laid down as follows:—

- (1.) To superintend the sanitation and conservancy of the port.
- (2.) To board all vessels arriving in port with infectious disease on board.
- (3.) To inquire into disease among the shipping in the harbour, and into the sanitary condition of vessels.
- (4.) To inspect pilgrim vessels before departure, and grant certificates upon which bills of health will be issued by the Commissioner of Police.

Scarcely any information has been received of sanitary works in the Madras Presidency, Madras. but an interesting comparison was instituted by the Sanitary Commissioner between the death-rates of particular towns and the expenditure in those towns on conservancy, with the result that those municipalities which spent the most show the lowest rates of mortality.

Mr. Clark's scheme for the drainage of Madras town was submitted in April 1875 to the Government of Madras, by whom it was favourably received. The Red Hills water-supply is stated, notwithstanding its imperfections, to be an incalculable blessing to the town.

Although sanitation generally in this Presidency is in an extremely backward condition, signs of improvement are perceptible in many directions.

A great deal appears to have been done in the city of Bombay during the year both in conservancy and in sanitary works. The Carnac Bunder nuisance is said to have been to a great extent rectified. Bombay.

No accounts have been received of civil sanitary works in the Presidency generally.

Projects of water-supply were under consideration for Delhi, Lahore, and Rawalpindiee. Punjab. In the latter case it is stated that the people were most impatient to have it carried out, the inconvenience experienced from the present scarcity of water in that town being very great.

Under the orders of Government, the Sanitary Commissioner held conferences with 18 district committees, with a view to impressing upon them the necessity of improving the sanitary state of the villages under their respective jurisdictions. He prepared a pamphlet describing the history, and embodying the elementary principles, of sanitary science; and he accompanied the reading of this pamphlet with ocular demonstrations of the effect of sewage on water. The members were then encouraged to ask questions and to offer any objections that occurred to them, which were discussed patiently and considerately. Dr. De Renzy was most agreeably surprised at the interest which these meetings seemed to excite, and the pamphlet was in such request that it was necessary to print 22,000 copies of it for circulation among the village population. "Before the sanitary evils of the province can be effectually dealt with," Dr. De Renzy observes, "the people must be informed of the nature and extent of these evils. Any attempt to force on sanitary improvements, the need of which would not be appreciated or understood by the people, must inevitably fail. The conferences lately held will, I believe, ultimately be of the greatest use in directing the minds of the people to sanitary evils, of which they had previously no conception."

The most important improvement in the North-West Provinces was the continuation and further extension of the drainage works which are being carried out for the improvement of the canal irrigated country of the Doab. This work was pushed forward with great vigour during the year. North-West Provinces.

The Meerut drainage scheme was in course of active prosecution. As the work is perfected, a great amount of water will be carried away from the site, and it is hoped that the ratios of mortality will be sensibly decreased in coming years.

In the Terai a considerable amount of good work was effected in the way of drainage works, for the purpose of doing away with swamps and marshes in the neighbourhood of centres of population.

In many towns which the Sanitary Commissioner visited he noticed very great improvement as compared with their state at his previous inspections a few years back. Moradabad had made such an advance in this respect since 1868 "as to be hardly recognised as the same."

No works of any magnitude were undertaken during the year in the Central Provinces, but improvement of the towns in respect of cleanliness, conservancy, and drainage was carried on. Central Provinces. To conservancy measures of all kinds, however, the lower classes are everywhere most averse, and every step in advance is therefore up-hill work.

The conservancy system which was introduced in Nagpore in 1873 continued to work well. Considerable improvements were effected in the drainage of certain parts of the town and in the Sitabuldee bazaar, but a comprehensive scheme of drainage for the town, which is much required, cannot yet be undertaken for want of funds, the cost of the new waterworks being still a heavy burden on the finances of the municipality. The water service was being extended to different parts of the town; the people appeared fully to appreciate the abundant supply of good water.

XI.

EMIGRATION.

EMIGRATION.
To the Colo-
nies.

There was a very great falling off in the number of emigrants despatched from Calcutta to the British Colonies during 1875-76. In some cases (Mauritius, Trinidad, and Jamaica) this was due to reduction in the demand; but in the case of other colonies great difficulty was experienced in obtaining the supply required, especially of females. For Demerara it was not possible to procure more than about half the required number. Despite all the lessons of the famine, the people in the densely populated tracts were almost as unwilling as ever to emigrate. The Protector of Emigrants remarks that, when there is no famine or serious scarcity, the terms offered by the colonies are not sufficiently attractive. In the case of Demerara in particular, although the rate of wages and other advantages offered appear to be sufficiently liberal, the fact of a free return passage not being guaranteed until after 10 years' residence in the colony operates as a deterrent to emigration.

The demands from the French Colonies of Guadeloupe and Martinique appear to have been fully satisfied, except that it was impossible to make up the prescribed proportion of females. Emigration to French and Dutch Guiana remained suspended, on account of the great mortality which had occurred among the Indian labourers in those colonies. In some instances it appears that they had been set to work in the gold mines, a description of labour which was not contemplated in their contracts, and which entails much hardship.

The following figures show the total supply, as compared with that of the two preceding years:—

	1873-74.	1874-75.	1875-76.
Number admitted to depôts	29,267	23,393	11,126
Do. despatched to colonies	24,569	20,230	9,251

A danger resulting from the difficulty of obtaining emigrants is the temptation to a keen competition among the recruiters, accompanied with misrepresentation and fraud. The vigilance exercised by the Emigration Department with a view to prevent these abuses led to the cancelling of 6·44 per cent. of the whole number of licenses, against 2·18 per cent. cancelled in the previous year.

Of the emigrants despatched, 4,382 are said to have been recruited in the North-West Provinces, 2,306 in Behar, 1,861 in Oude, and only 338 in Bengal proper and Orissa. An increased number were recruited in Nepal and other Native States.

The return emigrants numbered 2,674, of whom about two-thirds came from Mauritius, 443 from British Guiana, and 268 from Jamaica.

The death rates were as follows, compared with those of the preceding year:—

	1874-75.	1875-76.
In depôts	0·33	0·26
On outward-bound ships	1·4	1·74
On homeward-bound ships	2·2	4·41

The decrease of mortality in depôts of late years is very satisfactory. On board ship the arrangements for promoting the health and comfort of the emigrants during the year received careful attention, and the per-centage of mortality was generally very low; in two cases, however, it amounted to the seriously high figures of 5·35 and 7·10 respectively. The high rates on returning vessels are accounted for by the number who are placed on board as invalids.

From Madras there was a decrease in emigration to the British Colonies, only one ship, carrying 294 emigrants, having proceeded to Mauritius, and none to any other colony. Eight vessels sailed from Mauritius, with 1,247 return emigrants, and one from Natal with 383. The deaths during passage amounted to only 10.

There was no emigration from the port of Madras to any of the French Colonies, but from Pondicherry and Karikal three ships sailed for Réunion with 1,047 emigrants, one ship for Cayenne with 427, and one for Martinique with 470. This was about 61 per cent. below

the emigration of the previous year. Five ships arrived with return emigrants; among 352 who left Réunion there was one death, and of 784 from the other two colonies 62 died.

The number of labourers despatched to the tea districts was 29,314, against 21,690 in 1874-75, and 25,811 in 1873-74. Owing to the increased demand, there were 294 more licensed recruiters than in the previous year. A large number of those registered as willing to emigrate either absconded or at the last declined to proceed. This is believed to be partly due to fraudulent practices on the part of the recruiters, but partly also to the fact that sometimes coolies proposed to emigrate simply with a view to having their expenses to Calcutta paid. To the Tea Districts.

Of 10,420 who proceeded to Cachar and Sylhet, 7,490 were free emigrants, that is, not contractors' coolies. This fact is noticed as encouraging with reference to the future supply of labour to the tea districts. The increasing extent to which whole families emigrated was another satisfactory feature.

The districts from which the supply was principally obtained were, as formerly, those of Western Bengal and Chota Nagpore.

The per-centage of mortality in dépôts was favourable as compared with the statistics of the two previous years. There were also improved results during the passage to Assam, owing mainly to its shorter duration, and to the provision of additional warm clothing and shelter.

The expectation that by the scheme of State emigration to British Burma the Bengal districts afflicted with scarcity would be benefited was not fulfilled. The Calcutta Agency was closed on the 31st December 1875, and the field of recruitment was transferred to Madras, where it was believed that labourers better adapted to the requirements of British Burma could be obtained at a less expense. Besides the want of any spontaneous movement among the people, an additional hindrance lay in the general unwillingness on the part of the magistrates to forward the cause. Some entertained a strong dislike to the emigration of their people; others were probably prevented by press of business from taking up the subject with any earnestness; others were unwilling to use their authority in collecting people from a fear of its abuse by subordinates; while in other cases the class of people whom they desired to part with was by no means that which employers of labour desired to receive, namely, such persons as were unable or unwilling to work for their living at home. To British Burma.

Though cultivators by caste and profession, the Bengalees failed to give satisfaction, and the probability is that they can never be induced to devote themselves to the monotonous routine of tillage in a foreign land, where high wages are so readily obtainable. The most valuable agricultural settlers, as well as the most tractable and industrious people, are the inhabitants of the hilly districts of Chota Nagpore; but it was found impossible to obtain these, as they were already held in high estimation by the planters of the tea districts.

A very small proportion of the immigrants were afterwards unaccounted for, and this result the Chief Commissioner regards as satisfactory, considering the frequent easy opportunities the immigrants had for returning to their own country, and the natural distaste among that class of people to settle in a foreign land.

The reports with regard to sickness and mortality were very satisfactory.

The immigrants generally preferred simple coolie labour, and in only one case was their agency utilised under a regular engagement, when a Rangoon company employed a large body in speculations connected with the reclamation of waste lands.

Most of them found employment on the extensive railway and other public works, a few took service as policemen, some took to domestic employment, and not many to agricultural pursuits. It is hoped that, after they have amassed a little capital of their own, they will turn their attention to forming settlements for agricultural purposes. To British Burma this influx of labourers is a great boon, the population being very sparse, and the demand for labour great in every branch of industry.

XII.

EDUCATION.

STATE OF
EDUCATION.
Bengal.

Whereas in 1874-75 there was an increase in Bengal (not including unaided indigenous patshalas) of 1,050 schools and 36,015 scholars, there was in 1875-76 an addition of 376 of the former and 30,891 of the latter. The number of pupils, therefore, rose in a much greater proportion than that of schools, so that, although the actual increase of institutions was less, the statistics indicated the increasing stability of the system of education. While in the former year there were, on an average, 34 new pupils to every new school, the corresponding addition in the latter year was 82.

The proportion of boys known to be at school per 1,000 of the population was 12·4.

The policy of the Bengal Government is to foster pretty equally every kind of education, from the lowest to the highest. The annual expenditure on education amounts in all to rather over 400,000*l.*, of which 190,000*l.* is contributed by the people, and somewhat more than one-half by the State. The higher English education which leads to the Entrance examination is that to which the people contribute the greatest share, namely, 70 per cent. of the total cost; to middle education 63 per cent., or the same proportion as they pay towards female education; to middle vernacular education they contribute 55 per cent.; and 46 per cent. to the patshalas. Of collegiate and special education the chief cost is borne by Government, the people's share being 42 per cent. for the former and 21 per cent. for the latter.

Of the total number of scholars, 71 per cent. were in primary schools, which rose in number during the year by 346, with an increase of 27,209 pupils. The increase was almost entirely in the new patshalas. In the primary schools the principle of keeping the standard of instruction as low as possible was adhered to. This is intended to be done until the whole of the poorest classes shall have been brought under some kind of instruction. In the meanwhile all who have time or means for learning more are encouraged to resort to schools of a better class. With this view an intermediate class of schools was established in 1875, ranking between the primary and middle class, and the success of these schools showed that their object was appreciated. They will be found, the Lieutenant-Governor believes, to supply a want which has long been felt; they will attract the best and most promising pupils from the patshalas, who might have hesitated to enter a middle school, but who will imperceptibly be led onward through the agency of these schools to the higher stages of education.

The statistics of the middle class schools went to prove that an education which includes some acquaintance with English is now more popular than that which is restricted to the vernacular.

The complaint is reiterated by the Local Government that the youth of Bengal resort almost exclusively to two professions which are overstocked, the law and the public service, although other professions are fast expanding. The dislike of manual work creates a strong prejudice against the practical study of mechanics. Some progress, however, was apparent in connexion with technical education, certain efforts having been made spontaneously by the Natives themselves, though it still remains to be seen whether they will lead to practical results. On the occasion of the visit of the Prince of Wales to Bankipore, near Patna, the Native Chiefs and gentlemen of Behar formed a scheme to commemorate the event by founding an industrial institution at that place, and subscriptions were promised to the liberal amount of 20,000*l.* The Bengal Government agreed to allot 600*l.* annually as a grant-in-aid to this institution, on the condition that the subscriptions, invested in Government securities, should yield at least an equal sum.

The number of pupils at the Calcutta School of Art declined in consequence of the fees being raised. The medical profession appears to be becoming popular; the institutions all over the province were crowded by students.

Madras.

The number of institutions in connexion with the Government Department in Madras rose from 9,151 to 10,236, and the number of scholars from 255,737 to 284,480. In the former case the increase was really greater than appeared, owing to a difference in the mode of preparing the statistics.

Twelve middle class schools were added to the higher class, and a large number were transferred to the lower class. There were in consequence altogether 38 higher schools, not including collegiate schools, while the number of middle schools was changed from 455 to 281. The lower class schools increased in number from 8,306 to 9,528. Elementary education being in a very backward state in this Presidency, the Government were devising measures for its promotion.

Bombay.

Satisfactory progress was made in Bombay in the matter of education. The total expenditure incurred during the year in connexion with schools administered by Government

was 239,654 $\frac{1}{2}$ l., of which 113,632 $\frac{1}{2}$ l. was granted from the Imperial revenues, and 71,833 $\frac{1}{2}$ l. was raised by a cess on the land revenue.

From municipalities less assistance was received than usual, except in Sind, where the municipality of Sukkur set a good example by taking over all the vernacular schools belonging to the town. The Sukkur municipality also pays a large contribution for English schools supported by provincial funds. The other municipalities in Sind are also liberal in their grants for education.

Of the expenditure, 38 $\frac{1}{2}$ per cent. was devoted to primary boys' schools, 8 $\frac{1}{2}$ per cent. to middle class, and 10 $\frac{4}{5}$ per cent. to high schools.

The number of Government, aided, and inspected schools increased by 144, and the scholars by 12,026, the figures for the year being 4,478 and 250,712 respectively. The average daily attendance also increased from 177,547 to 186,834.

Vernacular schools for boys and men numbered, at the end of the year, upwards of 4,000. There was an increase of 140 schools during the year. The increase was only rendered possible by the exercise of strict economy. Owing, the Government observes, to the want of sufficient funds, all that can now be done is to improve existing schools by substituting for inefficient teachers certificated men from the Poona Training College.

The number of middle class schools was 160, with about 17,000 scholars. The chief tests of the efficiency of these schools are the examinations for certificates qualifying for public employment; the number of successful candidates during the year was 430 for the first class, and 1,239 for the second class certificate, against 373 and 928 in 1874. The examination returns of the Inspectors also showed that the schools, with few exceptions, had made progress in efficiency.

In higher and middle class schools there were 9,593 boys learning English, or 259 more than in the preceding year. The desire to learn English gives most sign of development in the capital itself. The number learning Latin rose from 242 to 289, and Persian from 757 to 835, while in regard to Sanskrit there was a falling off from 2,742 to 2,648.

With a view to supplement the knowledge acquired in childhood, night schools are established in some of the larger villages. Of these there were 87, with 2,650 adult pupils. They are not, as a rule, reported of very favourably, but some of those in or near Bombay are stated to be useful to operatives of the cotton mills.

Besides the schools connected with Government, there were about 3,330 indigenous schools. The information imparted in them is very meagre, and the masters dislike interference.

Among special colleges, the Grant Medical and the Poona Civil Engineering Colleges particularly distinguished themselves. On the working of the former the Principal reports that the result of the past year "will bear comparison with the most successful year of the '30 which have elapsed since the foundation of the institution." Fifty-nine freshmen were admitted to the college classes, which, added to the number left after the University examinations, brought the strength of the graduate and undergraduate classes up to 194—"a number unparalleled in the history of the college, and all the more remarkable seeing that the fees paid by a student amounted to Rs. 625 for the full curriculum." In the University examinations the proportion of successful candidates was larger than in any previous year. The students of the Civil Engineering College were remarkably successful at those examinations. Out of 12 candidates for the L.C.E. degree 9 passed, of whom 3 were placed in the first class.

The number of Government institutions in the Punjab (exclusive of the University College) Punjab. was 1,585, and of those receiving grants-in-aid 480. The figures show an increase of 67 in the former, and a decrease of 22 in the latter; but this apparent decrease was due to several schools having been transferred from the latter to the former class. The total number of scholars on the books at the end of the year was 115,284. The number of Government primary schools increased from 1,218 to 1,264, and the attendance from 59,984 to 61,131.

The question was under consideration of abolishing the Delhi College, and of utilising the savings for strengthening the staff of the College at Lahore, and for other educational improvements. The staff of both colleges being inadequate, it was thought that it would probably be better to maintain only one, and to make that one thoroughly efficient. It is said that the sons of the higher, and especially the official, classes wish to learn English, and the insufficiency of the teaching power at the colleges has hitherto been a difficulty in the way of meeting this demand.

Government schools sent up 58 candidates for the Entrance examination of the Calcutta University, and aided schools 41; of the former 30 passed, and of the latter 22.

A School of Industry and Art was opened at Lahore during the year, the object of which is to convey to Native students such knowledge of painting and drawing as may assist them in their special trades, and especially to develop, by improved methods of workmanship, the Native manufactures of India.

North-West
Provinces.

The information received regarding the state of education in the North-West Provinces during 1875-76 is very meagre. The attendance in Government colleges showed a considerable increase, and so did the number of candidates for the University examinations. In the number of village or hulkabundee schools there was an increase of 49, and in the number of scholars an increase of 1,055; and the district school committees were reported to take a hearty interest in elementary education.

Oude.

The total number of schools in Oude increased by 49, and the scholars by 5,820. Of the former, 42 were Government schools, 5 aided, and 2 unaided; in the last-mentioned class of schools there was a decrease in attendance. The pupils generally belonged to the higher castes.

The expenditure from all sources on education was 54,009%, being an increase on the previous year of 1,707%. The expenditure from private funds advanced from 8,855% to 9,875%.

In respect of primary instruction the village schools held the first place in both number and importance. A stimulus was given to them by the revision of the course of study, and the progress of the pupils was very satisfactory. A rule was introduced during the year that a village teacher's salary shall not depend upon seniority of service, but upon the number of pupils he can keep in regular attendance. It was reckoned that one man could not do justice to more than 30 or 35 boys, and when the attendance exceeds that limit, he is to be allowed an assistant teacher, without suffering any reduction in his own salary.

It was decided that the efficiency of middle class schools should be tested annually by a public examination, which will be to those schools what the University Matriculation test is to higher schools. The examination will be held at five different centres.

Higher education does not seem to be very popular in Oude. Much difficulty is found in inducing students to remain long enough in the schools to enter the matriculation classes.

Ajmere.

In Ajmere there was not much advance during the year in education, so far as increase of schools or attendance is concerned, but there was evidence of increasing efficiency in almost all classes of schools; and certain measures were under consideration for simplifying and popularising elementary instruction. A very large share of the work of education is performed by the Presbyterian Mission. The Government and missionary schools numbered respectively 36 and 88, and the scholars 1,934 and 2,897. Of the whole number of boys of a school-going age, about 17 per cent. were under tuition; in the North-West Provinces the ratio was 1 to 9, or 11 per cent.

The report of the Ajmere College was favourable, both as to attendance and efficiency; owing, however, to the staff not being strong enough to spend sufficient time on the upper classes, and also to the University examinations having increased in severity, the success in regard to the latter was not quite equal to that in the preceding season.

The City School, which had been maintained by the municipality experimentally for one year, proved so popular that it was taken over by Government, the municipality still making a grant of 180% a year towards its maintenance.

Central Pro-
vinces.

Satisfactory progress was made in the Central Provinces, and a sound foundation of primary education is stated to have been laid there. As was the case in the previous year, there was, with a decrease of Government primary schools, an increase of scholars. Government middle class schools remained unchanged in number, while in them also scholars increased. Besides larger numbers on the rolls, there was better attendance and also improved scholarship in all classes of schools.

Aided private schools, too, made progress, and unaided schools increased in number. In the latter, as far as is known, the instruction given is not particularly good, but the best of these will, as soon as they have reached the required standard, come into the class of aided institutions. The Government now spends as much as it can afford in the Central Provinces on public instruction, the further development of which must (the Chief Commissioner observes) be very gradual, and can only be looked for with the general spread of intelligence. The policy of Government will be to encourage indigenous schools opened by the people themselves, supported mainly by them, and looking for aid only in the shape of a payment according to results shown.

In the preceding year arrangements had been made for improving the status and efficiency of normal schools. Already in 1875 these measures were bearing fruit; more and better teachers were sent out from the male school, and at the female school there was a larger number of women under instruction, and they were more carefully supervised and trained.

With a view to giving to education a practical turn, industrial classes were established at the normal schools, whence those instructed would proceed to village schools, and there open similar classes for imparting instruction to the villagers in the improved methods known at present only in the towns. The addition of this element to the instruction given in village schools will, it is believed, render them much more popular, while it will certainly make them more useful.

Education in Berar is not in a satisfactory condition. One reason is that in past years Berar. disproportionate attention had been given to high and middle class schools, while the diffusion of primary education among the masses was comparatively neglected. Measures have recently been taken to remedy this defect by the reduction of schools not coming up to the standard of the class in which they stood. The inefficiency of the teachers and irregularity of the pupils are other drawbacks. The latter evil is partly unavoidable in an agricultural country like Berar.

Besides 236 indigenous schools (in 61 of which payments by results were made to the teachers), there were 462 Government schools, with 22,117 pupils; the numbers in the preceding year having been 456 and 22,084 respectively. The high schools were well reported on, and sent to the Bombay University the largest number of successful candidates on record.

In Coorg there was a slight decrease, confined entirely to the aided and unaided schools, Coorg. in the number of pupils under tuition. At the Mercara Central School there was a considerable increase of attendance.

With a view of exciting a more active interest in education among the people, panchayats (or school committees) of a few of the more influential men in each nad (or subdivision) have been formed. The duties of each panchayat are to promote the interests of the school by securing a good attendance and bringing to notice all irregularities, also to attend to the repairs of school-houses. This measure gives promise of being both popular and useful.

This year, like the two preceding it, was marked in British Burma by considerable advance British in educational matters. Three fresh appointments were made to the inspecting staff, and its Burma. operations were extended to every part of the province, including six new districts. Two additional middle-class schools were founded; and a system was initiated of annual competitive examinations with very attractive prizes attached. While Government schools increased from 24 to 26, Missionary schools under supervision rose from 27 to 33, and all other classes of inspected schools from 1,143 to 1,147. The aggregate of pupils attending all these schools was 38,447, or 1·37 per cent. of the population of the province.

The indigenous schools comprised 874 monastic and 255 lay institutions. The cause of education in British Burma is closely interwoven with the work of the monastic order. The priesthood, with all the powers and privileges it confers, is no exclusive caste, but is open for ingress or egress to every orthodox believer. It prescribes no kind of asceticism, but only enjoins a life of purity, temperance, and truth. The work of national instruction was probably undertaken, not with any motives of influence, favour, or advancement, but with a view to qualify catechumens, or as a means of simple intellectual diversion. In course of time it came to be regarded as the peculiar function of the order, and lay schools, where both sexes are taught, were probably designed not to compete with but to complete the machinery of the monastic seminaries. Every Burman boy is brought up under the discipline and control of the village recluse, to whom the family authority is temporarily delegated. He is housed and clothed and fed in the kyoung, and the parents are put to no trouble or expense throughout the whole period of his tuition. The master, as a rule, is strict and peremptory, yet sufficiently attentive to the moral and physical well-being of his pupils to earn their continuous attachment and esteem. His teaching aims at no high standard and has a strong religious tinge. With all its defects, the system is ready at hand and is popular, effectually securing all the benefits of discipline, diligence, and habits of punctual attendance. It seems only natural that the poongyees should regard with suspicion any foreign intrusion on their own domain, and should prove an actual obstruction in the way of any permanent mental progress. The present State policy is one of kindly help and conciliation.

The results of the Calcutta University examinations were very disappointing. Of 1,819 candidates sent up from 175 schools, only 566, or 31 per cent., succeeded in passing. The result was least unfavourable as regards Government schools, from which 37·6 per cent. passed. In the First Arts examination only 25 per cent. of the candidates were successful, and in that for the B.A. degree only 23·5 per cent. The examiners attributed this general failure to a want of careful and accurate preparation, the students having trusted too much to their memory without mastering the subjects. The students themselves put the blame on their teachers, and the Lieutenant-Governor appears to think that there may so far be truth in this that the multiplication of superior schools is in advance of the supply of adequate teaching power, for which dependence must be mainly placed on the English universities. UNIVERSITYS. Calcutta.

The Entrance examination still appeared to be to many the goal of their educational career. Of those who passed it only one-fifth passed the First Arts, and of the latter number only one-half obtained the B.A. degree. With a view to remedy this fault, it has been decided that the possession of a degree shall in future, as a rule, be considered necessary for superior appointments in the service of Government.

Madras. At the University Matriculation examination in Madras there was an increase in the number of candidates, but a great falling off in the proportion of those who passed, and the number of first-class men was much smaller. These results are put down to the unusual severity of the test in English, and to the introduction of physics and physical geography. A large increase in the number that came up for the First Arts examination was likewise attended with discouraging results, the number who succeeded being very little larger than in the previous year. The candidates for the B.A. degree rose from 85 to 105, and those who passed from 55 to 67.

Bombay. The examination for matriculation at the Bombay University was easier than usual; the increase in the number of candidates presented was only 154, while the increase in the number of those who passed was 172. The numbers were 1,269 and 434 respectively. The improvement was shared by all classes of schools; among students under private tuition the ratio of success rose from 1 in 17 to 1 in 8. More than half of the successful candidates joined one or other of the affiliated colleges, thus evincing their intention of pursuing their studies further. For the higher examinations the figures were also satisfactory, the number of passed candidates having risen from 150 to 173. This favourable result was, however, limited to the special faculties, the Arts faculty having shown a falling off.

Punjab University College. For the Entrance examination of the Punjab University College 159 candidates presented themselves, of whom 75 passed; and for the Proficiency in Arts there were 13 candidates, of whom 3 were successful.

MAHOMEDAN EDUCATION. Bengal. The number of Mahomedan boys under instruction in the province of Bengal increased from 87,917 to 91,223, the increase occurring almost entirely in elementary schools. In the University examinations, the law classes, the civil engineering classes, and the School of Art, Mahomedans formed a merely trifling proportion; on the other hand, in the Survey School at Patna and the Medical School at Bankipore, a considerable majority of the students were Mahomedans. It is stated by the Government that other signs are not wanting that the reluctance of the Mahomedan community to accept the higher education offered by Government is surely, though slowly, giving way. In the Calcutta Madrissa, 653 out of 991 pupils were learning English, while in the Dacca Madrissa a larger infusion of Western learning was introduced by the desire of the students themselves.

Bombay. In the schools connected with Government in the Bombay Presidency the number of Mahomedans increased from 24,310 to 26,277. The Principal of the Elphinstone High School reports that some of his best pupils are among the Mahomedans. On the other hand, the attendance at the special classes established for Mahomedans in the Bombay and Poona Anglo-vernacular schools was somewhat disappointing.

North-West Provinces. There was a falling off in the attendance of Mahomedans in the middle and lower schools of the North-West Provinces; while in high schools and colleges it remained unchanged, and in special schools greatly increased.

Berar. There is found to be great difficulty in the Assigned Districts in inducing Mahomedans to take advantage of the arrangements provided for their education. They are, as a class, poor and illiterate, and the parents generally have no desire for their children's instruction.

FEMALE EDUCATION. Bengal. Female education in Bengal was encouraged by the formation of scholarships for girls, and by the appointment of Mrs. M. Wheeler (a Native lady) as inspectress of female schools and zenana agencies. There was no increase during the year in the number of schools, but the number of girls in inspected schools rose from 15,654 to 18,425, the increase being chiefly due to the satisfactory circumstance of larger attendance at the aided primary schools. In the Deccan Division there were four zenana associations, composed of educated Native gentlemen, the object of which was to promote female education at home. These associations are believed to be doing very useful work. A great deal of domestic instruction of this sort appears to be carried on throughout the province amongst the higher classes, but the middle classes do not think the instruction of their wives and daughters worth paying for. To this fact an exception is found in the Brahmo community, amongst whom female education receives active and liberal support.

Madras. In Madras this branch of education was in a comparatively flourishing condition. The number of schools increased from 269 to 304, and of pupils from 19,582 to 23,793. In addition to these, some large schools are supported by the Maharajah of Vizianagram, and are under Government inspection.

Bombay. The interest taken in girls' schools in the Bombay Presidency is stated to be becoming a little more real. A school established in the capital met with large support from Native gentlemen, and the Telugu community set up a school themselves under trained female

teachers. The number of girls learning English in private schools was also increasing, having reached to between 800 and 900. In the Northern Division improvement was apparent in examination results; in the Southern Division the schools, with some exceptions, were poor.

The school at Kolhapore has been put on an improved footing, and arrangements have been made for the attendance in it of ladies from the palace and of the wives of Sirdars. A new female teacher from the Poona Normal School has been appointed to teach Marathi under the general supervision of Miss Moysey, governess to the ranees.

In Sind there was improvement in both attendance and results.

In the Punjab there was an increase of two in Government female schools, and a falling off of five in aided schools. The great majority of the people see more harm than good in educating women. Many gentlemen of position are said to interest themselves in the movement more from loyalty than conviction, desiring to stand well with the Government, who they believe have the cause of female education at heart. Punjab.

Compared with the two preceding years, a steady decrease appeared in the North-West Provinces in the number of girls' schools and of pupils in them. The falling off in the former amounted to a little over a quarter, and in the latter to about 14 per cent. North-West Provinces.

There were 94 girls' schools in Oude, of which 93 were primary, and one was of the middle class. The latter is the only good school for girls in the province; the teaching in it is Anglo-vernacular. Of the primary schools 76 were under Government, and 16 under private management; the teaching in all was equally imperfect. Oude.

The progress of female education in the Central Provinces was discouraging. Both the schools and pupils decreased in number, and the quality of the instruction was not improving. Of nearly 3,000 girls borne on the register, less than 400 could read at sight and write from dictation. In the present state of Native society and feeling, the Chief Commissioner does not look for anything like speedy improvement in this direction. Central Provinces.

The attendance of female pupils in British Burma increased from 2,680 to 3,528; in addition to the latter number there were 97 girls at the mixed Government cess schools. The progress is entirely due to the growing popularity of private seminaries, to which extensive aid is afforded, the proportion of Government pupils having been considerably reduced. British Burma.

The main difficulty still lies in the want of an efficient teaching agency. The social independence and energy of females in Burma prevent the obstructions common to other provinces being thrown in the way of their enlightenment.

The Bengal vernacular press maintained the same general tone as was noticed in the previous Report (p. 77). It was in many cases marked by an increasing querulousness, which however, Sir R. Temple observes, must not be mistaken for disloyalty, as at heart the Bengalees are thoroughly loyal, and show, under all circumstances, a steady and law-abiding spirit. LITERATURE AND THE PRESS. Bengal.

Among the books published, a biography written by Srimati Surangini, wife of the Principal of the Sanscrit College at Calcutta, is specially noticed, as pointing to the growth of intellectual tastes among Native ladies.

The number of works registered in Bombay during 1875 was 735, of which 103 were in English, and 433 were original works. A political pamphlet by a Native author, in English, on the "Revolution at Baroda," is stated by the Reporter on the Native press to be "of considerable importance." The general tone of the publications was reported to be unobjectionable as regards morality and loyalty. Bombay.

The list of newspapers amounted to 61, against 55 in the previous year. Most of them have no special object, and are largely occupied with questions of social or religious interest, and with local grievances, such as the decay of Native industries, cases of the police courts, and the faults of the railway or municipal authorities. Last year there were topics of interest in the floods of the Sabarmuttee, the Deccan riots, and the opening of arbitration courts. The death of the Rao of Kutch called forth expressions of regret; and many of the Native papers spoke with feeling of the death of Dr. Wilson, and of the loss thus caused to science and to the cause of progress.

The Central Book Dépôt, which was opened during the preceding year in Rangoon, with agencies in the several districts, for the sale of educational works and appliances, was very active in its operations during 1875-76; up to the end of that year 12,661 volumes had been sold, realising 7907. British Burma.

Efforts were made to explore and utilise the rich and varied treasure of Buddhistic manuscripts which have long been lying unnoticed in every Burman monastery. The deputy inspectors of schools during their tours in the interior prepared lists of the Pali and

Burmese writings they encountered, and reported the conditions under which copies are available for the proposed library at Rangoon. A condensed list has been arranged and submitted to the Chief Commissioner, and there is every prospect of an interesting collection being formed.

The Rangoon Literary Society in its 16th annual report showed a steady progress ; besides the Government grant-in-aid of 30%, receipts from various sources aggregated 261% ; the disbursements amounted to 268%, of which 76% went in working expenses, and the rest was expended in improving the library.

The " Education Gazette " did not appear to be a success from a financial point of view.

XIII.

NATIVE STATES.

Although the Rajah of Hill Tipperah was still labouring under financial difficulties, some progress was made in several directions in the administration of the State. The Rajah showed a laudable desire to restrict his expenditure, dispensing with wasteful and extravagant displays and reducing the number of useless retainers; he was, however, still surrounded by many persons whose influence was obstructive to social and administrative advancement. An improvement in the revenue enabled him to make considerable remissions to the cultivators at the foot of the hills whose crops had been damaged by inundations. There was increased efficiency in the administration of the law. Serious crimes were comparatively rare.

Hill Tip-
perah.

The Rajah at length began to show a real interest in education, which was in an extremely backward condition, there being only four schools, with 173 pupils, in the whole of the State. Changes were made in the staff of teachers; orders were issued to enforce attendance; and it was in contemplation to institute several new schools, including one for girls.

A favourable account is given of the administration of the Cooch Behar State under the general direction and supervision of the Deputy Commissioner. The results in regard to education, and in other departments also, compare favourably with those of British districts. The public library is stated to be far in advance of any other similar institution in Bengal outside Calcutta. This State possesses the great advantage of a sufficiency of funds for expenditure on all useful purposes.

Cooch
Behar.

In the Tributary Mehals under the Bengal Administration the season was good, and the people prosperous and contented. On a visit by the Commissioner to the Sirgoojah estate, not one person had any complaint to prefer. The administration of justice was conducted very creditably by the Chiefs; only three appeals from their decisions were put forward. Serious crime continued to be rare; but the practice of carrying arms, with that of drinking to excess, led to some hasty acts of violence.

Tributary
Mehals.

The quietness that usually prevails among the feudatory Chiefs in relation with the Central Provinces was somewhat disturbed in the case of Bastar. The Rajah set out from Jagdalpur, his capital, for the purpose of being presented to the Prince of Wales, leaving in charge two men who were peculiarly obnoxious to the people. He had not gone far when commotions occurred which rendered it expedient for him to turn back; and on his way he was met by a large number of villagers, who demanded the dismissal of the two ministers. The Rajah, in alarm, ordered his soldiers to fire on the villagers, who fled in all directions, leaving eight dead and wounded. A few days afterwards Jagdalpur was completely invested by some thousands of persons, who flocked in from the surrounding villages, armed with very miscellaneous weapons. The Rajah with some difficulty managed to send word to the British authorities, upon which some European officers, with a small force, were despatched to Jagdalpur. The arrival of the officers seemed to satisfy the villagers, who, on being assured that their grievances would be inquired into, were easily induced to disperse and go quietly to their homes. It was a remarkable feature in this incident that those concerned in the rising, although belonging to a wild and excitable race, showed throughout the utmost moderation and forbearance; they even scrupulously restored to the Rajah some treasure which had fallen into their hands.

In the last Report (p. 80) it was mentioned that three of the tributary estates were under British management, owing to the misconduct of the Chiefs. Khairagurh continued to improve, and the people were contented and prosperous. The whole of the debts have been paid off, and funds will in future be available for communications and other works of improvement. In Patna also, signs of progress were everywhere visible. A new settlement was made, which almost doubled the revenue, but was nevertheless fully agreed to by the people. Cultivation greatly increased; vaccination progressed, and the people were far from hostile to it; the dispensary did useful work; and some advance was made in the schools. There was hardly time for much to be done in Sakti, but the British officer in charge inquired into the sources of revenue, made a land revenue settlement, and arranged for the proper administration of justice.

The Cuttack Mehals in Orissa were for the most part well managed by their respective Chiefs, and good progress was made in opening out the resources of the country. Except in a few of the minor States, the people were described as prosperous and contented.

The actual number of offences reported showed an increase as compared with the previous year, but the increase occurred in the Banky estate alone, and the great majority of the cases

reported were petty assaults, thefts, and acts of mischief. Serious offences against property were of rare occurrence, and there were no cases of dacoity. Such crime as occurred was promptly dealt with; in some of the States an organised police force is maintained.

One middle class and seven lower vernacular schools were opened during the year, and the number of pupils on the rolls was 2,899, against 2,679 at the close of 1874-75. The Chiefs of Keonjhar and Dhenkanal especially exerted themselves to extend the benefits of education to their people. The same Chiefs were complimented by the Government on their generally enlightened and liberal administration.

Cashmere.

Sir Henry Davies recorded, in anticipation of the close of his administration of the Punjab, his acknowledgment of the loyal and friendly spirit which had been uniformly evinced by the Maharajah of Cashmere in furthering the wishes and policy of the British Government. He also observed that the Maharajah is doing his utmost to develop the great resources of his country.

The depression in the Cashmere shawl trade continued, and so did the efforts made in consequence to supplement the revenue by the cultivation of silk and of hops.

A museum of Cashmere products and manufactures was being formed at Srinuggur, and it was intended to have a second at Jummoo, and a third in London, so that purchasers may select their samples at the latter and give their orders accordingly.

The Maharajah visited Calcutta to be present at the arrival of the Prince of Wales, and the Prince was afterwards splendidly entertained by the Maharajah at Jummoo.

Simla Hill States.

There was little to notice during the year in regard to the Simla Hill States. The administration of Sirmur was creditable, the Rajah having made every effort to develop its natural resources. He spent large sums of money in iron foundries, which, owing to the difficulty of carriage from the mines, had not so far proved a financial success; the experiment was, however, considered by the Punjab Government to be one well worthy of every encouragement.

Puttiala.

The Maharajah of Puttiala went to Calcutta on the occasion of the visit of the Prince of Wales.

This enlightened ruler (Mohindar Sing) died on the 14th April 1876. During the last months of his life, owing to his failing health and to accidental causes, the affairs of the State had fallen into some disorder, but with this exception his administration was a remarkably efficient and successful one. It was conducted mainly on the British model.

Kuppoorthulla.

Owing to the mental infirmity of the Rajah, the State of Kuppoorthulla was under British administration. The road connecting the capital and Sultanpur was being raised and metalled. A new college and dispensary were opened, and a residence for the Rajah at Jullundur was approaching completion.

Bhawulpore.

Bhawulpore continued under British management. A large amount of work was done in opening out new lines of canals and protecting the country against inundation.

Rajpootana States.

The year was distinguished in Rajpootana by visits, first from Lord Northbrook, and later from the Prince of Wales. The Prince's visit and intercourse with the Chiefs elicited unmistakeable signs of loyalty and respect.

The Chiefs of Jhallawar, Serohi, and Kerowlee died during the year. In the first of these States the adopted heir was a minor. There were altogether five States under the direct administration of officers appointed by the Government of India, viz., Oodeypore, Ulwur, Kotah, Dholepore, and Jhallawar.

Throughout Rajpootana the autumn harvests were on the whole plentiful, although in some places the crops were damaged by the violent rains and floods which occurred in September.

The country generally was unusually quiet. Gang robberies and violent crime have on the whole much diminished, owing mainly to the cessation of internal political disorders.

The Mayo College was opened on 1st October 1875, and on the 1st April following there were 23 on the rolls. The first student entered was the young Maharajah of Ulwur, who is reported to have done credit to the college training. The Chiefs of Jodhpore and Jeypore have given the institution their active and influential support; the former has sent to it his brother, a remarkably clever boy. The new Chief of Jhallawar also joined, and the representative of another noble family was expected.

Oodeypore.

The administration of the Oodeypore State by Colonel Herbert was judicious and popular, while the Maharana gave every promise of proving hereafter a good ruler. The members of the Regency Council were beginning to discuss questions and to give their opinions with increasing confidence.

An experiment introduced in the previous year of fixing the revenue demand at a money rate for a term of ten years in certain districts did not succeed, and the old system of levying

the dues in kind has been reverted to. When the crops had been ruined by excessive rain and the revenue was nevertheless demanded, the cultivators of a hundred villages set off in a body for Malwa with all their property, followed by the collectors and the money lenders, who both entreated them to stay, but did not attempt to use force of any kind. The cultivators eventually dictated their own terms.

In Jeypore little violent crime came to light, and education made good progress in the capital. The expenditure on public works amounted to 61,796*l.*, the largest sum yet expended in any one year; the outlay on irrigation was twice as great as it was in 1874-75. The Maharajah is said to have the hereditary taste of his family for public works and the architectural embellishment of his capital. Sanitation appeared to be limited to the city. An ample supply of good drinking water has been ensured by the completion of the water-works. The city has been partially lighted with gas. The jail sustained its good reputation. The Mayo Hospital was opened by the Viceroy in December. Jeypore.

In Jodhpore also crime decreased, especially dacoity. The arrangements of the jail were commendable. The dispensaries were in good working order, and vaccination steadily progressed. Jodhpore.

Nawab Sir Faiz Ali Khan continued to show firmness and ability in his management of the Kotah State. In his administration of the finances he attained great success. He reported that he had in two years realised 422,052*l.*, and expended 395,681*l.*, of which 151,756*l.* was disbursed in the payment of debts. The judicial returns showed an increase of crime, which, however, is attributed to the institution of a regular system of police reporting. Kotah.

The rainfall was good, but the crops were under the average. Notwithstanding the latter circumstance, grain was so abundant that there was no sale for it.

The administration of justice in Bhurtpore is systematic, and is probably as good as in any of the Rajpootana States. The land revenue settlement appeared to be working satisfactorily. There were 38 new schools opened during the year and 23 closed; pupils in the city schools were certified as showing proficiency. Bhurtpore.

The finances of the Dholepore State were in a prosperous condition. The collection of land revenue amounted to 76,339*l.*, instead of 64,000*l.* as estimated. The working of the police and the administration of justice were creditable. The dispensaries were steadily increasing in popularity, and the number of vaccinations advanced from 4,903 to 6,919. The young Rana continued to make satisfactory progress with his education. Dholepore.

In Ulwur the faction which attempted in the previous year to contest the succession of Mungul Sing was extinguished by the death of Lukdeer Sing in September, his partizans having since gradually surrendered. The administration went on smoothly under the superintendence of Major Cadell. Ulwur.

The condition of the finances was satisfactory; the last of the debts were liquidated during the year. The departments of justice, public works, education, and vaccination were all well reported on.

In Bickaneer the administration of justice was not satisfactory, though there was improvement. Crime is stated to be "chiefly looked upon as a source of revenue." Bickaneer.

Colonel Carnell, who temporarily administers the affairs of Serohi, is reported as possessing a thorough knowledge of the State and the people. His influence and energy enable him to render valuable services in maintaining order throughout a wild and lawless country. The young Rao is said to be alive to the necessity of improving the financial condition of the State, and it was hoped that the debt might be cleared off in five or six years. There was promise of better relations between the Chief and his thakoors owing to the amenability of the former. Vaccination was becoming more popular. Serohi.

The great event of the year in Central India was the visit of the Prince of Wales, who was received here, as in Rajpootana and other Native States, with great enthusiasm. Before his arrival the Governor-General's Agent consulted with one of the principal Chiefs as to the expediency of interdicting all presents to the Prince, owing to the great expense that would be involved in his making returns of commensurate value. The Chief in question, an astute, intelligent, and economical man, expressed his decided opinion as follows:—"This is an event without precedent, don't attempt to shape it by anything which has gone before; for the first time during your rule of India, India is to be visited by the Sovereign, for in the Shahzadah, the Queen's heir, all will see their Sovereign. We, the Chiefs of India, owe it to ourselves to receive the Shahzadah in a manner becoming to us. I could not meet His Royal Highness without an offering, and I could not present a small offering. Advise Chiefs to present something in their possession—heirlooms or curios. Leave the rest to us." Accordingly no one was content who had not an opportunity of offering some treasured possession. Central India States.

The Maharajah of Gwalior said to the Prince: "There have been Sindias before me who have won great honour, but no ancestor of mine has been so honoured as I am to-day."

Holkar's reception of His Royal Highness was likewise most cordial. His capital was illuminated, he devoted himself to the comfort of his guest, and made him costly offerings.

The Viceroy, in a tour which he took in Central India, was much gratified in observing the interest taken by the Native Princes without exception in the liberal education of the higher ranks, and in the sound and useful instruction of the lower classes of their subjects.

The Rajah of Dhar has recently constructed a new college. In the college at Rutlam, besides the usual courses of instruction in English, Persian, and Hindee, there are normal classes for the training of village schoolmasters. At Jowra the Nawab is himself a good English scholar, and takes a keen personal interest in the college there. At Indore a good collegiate school is attached to the Residency; the Maharajah is a patron of it, and his eldest son is completing his education there.

A most gratifying circumstance connected with all these institutions is the large number of young men of high rank who attend them. At Jowra the Mussulman nobles of the State are giving their sons a sound English education.

Gwalior.

Maharajah Sindia went to Calcutta to be present at the reception of the Prince of Wales, and from thence proceeded to Delhi, where he took a lively interest in the operations at the Camp of Exercise. The Prince afterwards spent three days at Sindia's capital, where no expense was spared to do him honour.

Indore.

The Maharajah of the Indore State holds the reins of Government in his own hands, and it is only in matters not affecting the revenue or the established customs of the State that the Minister has any control. Complaints are made of the over-assessment of the land and oppressive exactions from the ryots.

The revenue amounted to 459,800*l.*, against 500,000*l.* Of the deficiency, nearly 30,000*l.* was due to failure of collections under the head of land revenue, and the rest under customs; but in regard to both these items the State may be considered to have suffered to the advantage of its subjects. The disbursements were within the receipts by about 50,000*l.*, so that the financial condition was very satisfactory.

The cotton mills were very profitable to the State. The management (under Mr. Broome) was admirably conducted. The weight of cloth produced during the year was 394,488 lbs., while orders were received for 475,148 lbs. It was in contemplation to increase the number of spindles.

The dispensary was well attended, 11,373 persons having received aid from it.

There were 77 schools in the State, attended by 3,235 boys. The standard of education at the High School was good, and several of the pupils have from time to time passed the Bombay University Matriculation examination. A scheme for further extending education was under consideration.

Rewah.

The Rewah State (*see* last Report, p. 84) was under British management. Matters worked smoothly during the year under the supervision of Major Bannerman, who evinced much tact, and whose measures gained the confidence and approval of both the people and the Chief, and resulted in great benefit to them. Criminal and civil courts were instituted, and worked well. The system of letting out the State revenue to three or four of the most powerful Sirdars, who had complete jurisdiction in the leased districts, was replaced by a temporary settlement for two years; and the management and collection of revenue were proceeding satisfactorily. Considering the lawlessness and confusion which had long prevailed, the work of re-organisation was at first a very difficult one.

Bombay States.

The reports to Government by the several political officers as to the effect produced on the Native Chiefs by the visit of the Prince of Wales, and by his courteous and kind bearing towards them, are most satisfactory, and that not only in relation to the British Government, but in many cases also in their relations with one another.

Lieut.-Colonel Barton, Political Agent at Bhuj, then serving in the Rewa Kanta, says:—

"The Chiefs all expressed themselves much pleased with the reception accorded them, and appreciated highly the honour of their interviews with the Heir-Apparent, and of receiving mementos of his visit from His Royal Highness. Independently of the honour thus conferred, there is no doubt that, although visits to the Presidency are attended with considerable expense, they are productive of great benefit to the personal character of the Chiefs concerned in them. For the time being these potentates are removed from the narrow sphere in which they live and move and have their being; they find that they have to mix with all classes of society, that there are many of equal and some of infinitely superior rank to themselves; and in the daily meetings with their fellow-Chiefs they are obliged for courtesy's sake to forego their petty jealousies and inherited animosities. This effect has been notably apparent amongst the Rewa Kanta Chiefs. Ten years ago they all

“ had divided interests, their land disputes had existed for ages, and ancestral feuds had
 “ been transmitted through bygone generations. So great was the animosity thus aroused
 “ that one Chief would not meet another, and this feeling was carefully fostered by those who
 “ surrounded them.

“ This phase has happily passed away. All points in dispute have been settled, family
 “ feuds have been healed, and close friendships engendered in the healthy atmosphere of the
 “ Rajkumar College. The royal visit has completed what there was wanting to the *entente*
 “ *cordiale* between the Chiefs of this Agency. For the first time in its history all its sub-
 “ ordinate rulers of territory extending over 4,000 square miles met in the saloons of his
 “ Excellency the Governor. I was subsequently present at an evening party given by the
 “ Rajah of Baria to his fellow-Chiefs and a small circle of English friends. Good humour
 “ prevailed, the guests retired mutually pleased, and since then the most cordial feelings
 “ have been maintained amongst them.”

A further good effect produced is that some of the more powerful Chiefs have determined
 to commemorate the event by the erection of some public works of a permanent character.

*Kutch.	Rewa Kanta :	The Rao of Kutch, who died during the year, set
Kattywar :	Baria.	apart the sum of 20,000 <i>l.</i> for the construction
Bhownuggur.	Sunth.	of a breakwater and harbour works at Mandvi,
Gondal.	Lunawara.	which are to be named after the Prince. At
Morvi.	And 12 small estates.	Kolhapore a hospital is to be built, also bearing
Limri.	Kolhapore (including	the Prince's name.
Wadwan.	minor estates):	
Wala.	Miraj, senior branch.	Of the Native States within the Bombay
Jhinjhuwara.	Mudhol.	Presidency a large number* were during the
Mengni.	Akulote.	year under the direct management of British
Pahlunpore :	Juth.	officers ; including Baroda, the area of the States
Tharad.	Sawunt Waree.	so managed aggregated 25,476 square miles,
Mahee Kanta :	Narakote.	and the population 5,000,000. Kolhapore has
Edur.	Peint.	been under a British Agent since 1866, owing
And 17 talukas and	Surat :	to successive minorities, and Sawunt Waree has
villages.	Sachin.	been under similar control since 1838. Nara-
	Bansda.	

kote and Peint are under permanent supervision, and are rather non-regulation than
 independent territory.

In States under management the revenues were generally flourishing. Indeed the normal
 business of political officers has come to be to receive States deeply involved, and to return
 them to the young heirs free of debt, their revenue improved, their administration consoli-
 dated, and with usually a handsome cash balance invested in the Government securities.
 The condition of Bhownuggur is particularly satisfactory. The joint administrators have
 secured to this part of Kattywar a remarkable degree of prosperity, and by careful attention
 to the requirements of merchants have succeeded in attracting a large proportion of the whole
 trade of the province, though Bhownuggur is by no means most conveniently situated for a
 central port.

The northern States are wealthier in natural resources than the southern, but are socially
 less advanced. In the latter a settled state of society has been much longer in existence, but
 the soil is poor and exhausted, and the people are less interesting.

In the north, frontier disputes have greatly diminished of late years. There was only one
 disturbance of this nature during 1875-76. Two intestine disputes, accompanied with
 bloodshed, occurred, both originating in resistance on the part of the Girassias to lawful
 demands by the Durbar officials. The Jadeja Court, in Kutch, did a creditable amount of
 work during the year ; 1,176 cases were decided, including 177 of long standing. This, and
 the Rajasthanik Court in Kattywar, are established for the purpose of settling disputes of the
 above nature. The business of the latter court is to survey and map the Girassia's landed
 estate, to fix his miscellaneous dues, and also to define his relation to his Chief by laying
 down on a reasonable principle the extent of his municipal and political obligations. The
 survey and settlement work of the court has proceeded in a way that is perfectly satisfactory,
 and by the unanimous wish of the States concerned it is to be continued for five years beyond
 the term originally sanctioned.

The work of the Rajkumar College was steadily carried on throughout the year, and, with
 two exceptions, the attendance of the boys was regular and their progress good. Their
 conduct also was reported on in the highest terms. They continued their mounted drill,
 and most of them were good riders ; they also had regular instruction in gymnastics.
 A new stimulus was given to cricket by the institution of matches between the college
 and the Kattywar High School, which are likely to be of good service to both.

This college is supported by the Kattywar Chiefs, and is said to be rapidly gaining their
 confidence. The Bombay Government regard it as a reform pregnant with good to India

that those who are hereafter to have an important share in the business of government should be brought up apart from the enervating influences of the zenana and the degrading superstitions of its atmosphere.

The police statistics of the northern States showed little violent or serious crime. The institution of a federal police has had the desired effect; during the year there was no plundering by outlaws, no village was attacked, and the number of dacoities was considerably diminished.

This state of things is most creditable alike to the Agency and to the Chiefs, and Government have readily consented in consequence to the cessation of the employment of the special police under Captain Humfrey, feeling it far more satisfactory that the peace of the country should be maintained by the independent good administration of the States, in friendly co-operation with the Political Agency, than by the direct interference of Government.

The Chiefs have intimated their readiness to consider proposals which may make the maintenance of the federal police less burdensome to the States supporting it. Government have the more readily conceded these points, as guarantees for security of life and property have very much multiplied during recent years. Not only are regular bodies of police everywhere better drilled and remunerated, and in more general favour, but the Chiefs are more careful to avoid a reputation for sheltering criminals, and have less objection to furnishing returns; whilst village police are being almost universally introduced, and thus each village is being provided with officials responsible for the immediate prosecution of offenders. But, perhaps, the most effectual safeguard has been the concentration of the inferior powers of the lesser landlords in the hands of thanadars, or petty stipendiary magistrates, to whom have been allotted jurisdictional circles embracing all the territory not in the hands of Chiefs capable of exercising a vigorous control.

In the southern States the police are generally indifferent, but here too improvement is being effected. The statistics of crime showed little change as compared with the previous year, but, if anything, a tendency to increase.

A satisfactory feature in this part of the country is the extension of municipal government to many of the large towns, and to most towns water is being supplied. Miraj, with its wide roads, well lighted and lined with trees, its general conservancy, and its convenient water-supply and markets, is stated to be a conspicuous example of what constant attention on the part of a political officer may accomplish.

The financial condition of these southern States is generally sound. The expenditure on public works is very small where a political officer is not in charge. The only industry is agriculture, and the produce is seldom of sufficient value for export. Both vaccination and education made satisfactory progress during the year in all the States.

A most important work has been commenced by the formation of a private class for the wives of the Chiefs and Sirdars, in addition to the education provided for their daughters. Marriage occurs so early that practically girls can be taught little unless their education is continued after marriage. The young wives of the Chiefs of Mudhol and Baura were already fitting themselves for their position in this way.

Baroda.

Sir Madava Rao commenced his duties as Minister of the Baroda State on the 10th May 1875, and on the 27th of that month Syajee Rao was adopted by the Maharanee Jumnabai. The Minister has submitted an able report of the first year of his management.

Owing to the extreme state of confusion into which everything had fallen under the past *régime*, it was not possible, even with the greatest efforts, to close the accounts or to present any precise information as to revenue and expenditure.

The general results for the year are gratifying, but in one branch of the administration the Government of India have expressed their hope that speedy progress will be made, namely, in the adjustment of the large number of pending Girass cases, which have been a sore point in the annals of Baroda ever since 1864. The number of undecided cases was 2,354. The meaning of the term "Girass" is as follows. The portion of a village (usually one-fourth) which was left to the lords of the soil by the Mahomedan conquerors free of rent was called "Wanta," and the holder of the "Wanta" was named "Girassia." But there are Girassias of another kind who are very numerous, viz., men who in former times plundered the country and received a consideration in cash or land or kind from the villages as the price of protection and immunity from plunder,—in other words, blackmail.

The condition of the country at the close of the year was tranquil, and violent crimes were rare. The absence of complaints at the Residency appeared to point to the general contentment of the people.

A complete system for the administration of civil and criminal justice was in operation; the judges and magistrates were, generally speaking, men of experience and good character. Capital punishment, which from mistaken ideas of humanity, or from fear of responsibility, had been practically abolished, was revived. Sir Madava Rao had reason to believe that

under the former system murders had decidedly increased. It was notified that women and Brahmins, who had heretofore been regarded as absolutely exempt from execution, would not in future enjoy any such immunity.

The report shows that the Minister attaches great value to public improvements of all kinds. The capital has been considerably improved, and efforts have been made to keep it clean, but it is still in a bad state and requires a proper drainage and good water-supply. There was a violent outbreak of cholera during the hot season of 1875.

The young Maharajah was making excellent progress in his studies, and due attention was given to physical development and sports. So far the Governor-General's Agent regarded him with the greatest hopefulness.

Education, generally, was receiving due consideration at the hands of the Minister. The number of schools supported by the State was added to; and a ready consent was given to a suggestion that a school should be provided for the children of Europeans and Eurasians resident at Baroda who are not able to send them to Bombay.

A scheme for affording medical aid throughout the State was determined on, and awaited the arrival of an English doctor to bring it into practical shape. There has already been for some years a very fair dispensary in the city of Baroda. A charitable custom prevails in this city of daily distributing food at the cost of the State to about 7,000 Hindoos and 3,000 Mahomedans; great abuses have naturally grown up under this system, but reform will have to be very cautious and gradual.

The year was marked in Kutch by the death, on the 1st January 1876, of the Rao, who was a vigorous and enlightened ruler. He was succeeded by his eldest son, a promising boy of 10. There was an apparent increase during the year of petty crime in this State, but this was chiefly due to increased facilities for detection and punishment. No cases of dacoity or border fights, or of infanticide, were reported. The late Rao recognised his obligations in regard to measures of sanitation, to which increased attention is stated to be given year by year. In the finances of the State there was a deficit of 11,317%. The revenue was less than that of the previous year by nearly 8,000%, consequent, it is said, on failure of rain. Expenditure on public works amounted to 22,683%, of which 15,817% was for the new palace. The latter expenditure having now ceased, money will be set free for more necessary works. Education did not progress very rapidly, but the quality of the work done is said to have improved. The field survey, commenced in 1873, made progress; this survey will not at present be followed by a revenue settlement, but it will be valuable as a record of rights and measurements.

Imports into Kutch very largely exceed the exports. The intended improvement of the harbour (already referred to, p. 69) will, no doubt, do much for the development of trade. Besides its local coasting trade, the port has trade connexions with Muscat and other places in the Persian Gulf, Kurrachee, Aden, Zanzibar and the African Coast, Bombay and ports on the Malabar Coast, and even with Calcutta. It receives grain, groceries, oilman's stores, cloth, paper, ivory, iron, brass, and copper wares, in exchange for cotton, wool, alum, ghee, garlic, and coarse cloth exported.

Some points in regard to Kattywar have already been mentioned. The Chiefs have combined for the construction of metalled and bridged trunk roads leading to the railway and seaport towns. At the close of the year 22 miles of road were completed and opened for traffic, 13 more were metalled and bridged, and 5 miles were partly constructed. Another important work was the construction of a lighthouse at Verawal by the Nawab, with a lantern containing a fixed dioptric lens, visible at a distance of about 20 miles. The south-west coast is thus effectively lighted for the steamboat traffic with Bombay, Kutch, and Kurrachee. The cotton industry was in a very promising condition.

The staple productions of Kattywar are cotton, wheat and common food grains, and wool, which are all exported. The wool is from the northern and western districts. The cotton is mostly exported from the north and east by the railway, and by the ports of the Bhownuggur group. The trade returns from Bhownuggur show a trade from that port with 62, and from Mahuwa with 49 ports, which are all within the limits of India, except Bussora and Bunder Abbas. The great bulk of the trade is with the port of Bombay, Surat coming next, and Bulsar third. Rice, gram, and dates are imported from Sind, and cocoanuts from the Madras ports. There is a large import of rice also at Verawal, for the food of the higher classes.

The statistics of trade show that the exports of Kattywar greatly exceed the imports in value, and a large amount of coin is annually imported. In 1875-76 an addition of 31 lacs of rupees was made to the currency through the Bhownuggur ports alone. The export trade is expanding with improved roads and harbours.

Education made good progress. The local committees provided additional funds, and accepted the Government system of annual budgets and of paying masters by results. The

increase of schools was 19, and of pupils 2,763 ; the total number of the former being 417, and of the latter 23,266. There was an advance in the number of persons vaccinated from 77,700 to 80,857. The Chiefs are stated to show a remarkable readiness to afford their subjects medical relief. They voted 150% towards the expenses of Dr. H. V. Carter when investigating the subject of leprosy in their country.

Pahlunpore.

The amount of crime in the Pahlunpore Superintendency was very small, consisting principally of cattle-stealing and petty thefts and robberies. A village police system was being carefully organised. Information regarding trade is scanty ; the principal articles of import were piece-goods and molasses ; and of export, grain. There was an increase of 789 in the number of vaccinations. The schools numbered 20, having increased by one, and the attendance also improved.

Mahee
Kanta.

In Mahee Kanta vaccination showed about the same advance as in Pahlunpore, and the attendance at the 45 schools somewhat increased. The statistics of crime were rather more favourable than in the preceding year, but complaint is again made of the number of cases of assault and theft arising from the drinking propensities of the Bheels and Kolis. These people first steal to get the liquor, and then become quarrelsome. The number of liquor shops was, however, reduced from 490 to 277 during the year, and other stringent measures with regard to the sale of liquor have been taken. Though crime was less, the number of deaths by violence was greater by 10.

Rewa
Kanta.

In Rewa Kanta also crime diminished, the decrease being most marked in murder, robbery, housebreaking, and theft. This is attributed to the fall in the price of grain consequent on very favourable seasons. A stimulus was given to education by the introduction of the budget system, and the increase by the Chiefs of their grants for this object. The number and attendance of scholars on the whole largely increased. Under vaccination there appeared a falling off. An outbreak of cholera was the occasion of demonstrating the advance that had been made in the civilisation of the people. In former epidemics poor old women had been cruelly tortured, in the belief that they were the cause of the evil and were feasting on the livers of those who died. Nothing of the sort occurred on the recent occasion, and only such superstitious ceremonies were resorted to as pouring milk round a town or encircling it with a cotton thread.

Trade revived during the year ; the returns of all the northern States showed a large increase in articles both of export and of import. The former are principally composed of grain, mhowra, timber, oil, and ghee ; the latter of piece-goods, salt, tobacco, and groceries. The improvement in roads and water-supply, which has been going on for some years past, and the security engendered by a better police system, have tended to increase the trade between Guzerat and Malwa.

Of the whole area 35 per cent. was under direct management. The Baria State was in a flourishing condition ; and it will be made over in due time to the young Rajah with all the debts cleared off, the water-supply and means of communication greatly improved, the land revenue increased by about 25 per cent., an organised system of police, and well-defined boundaries.

It has been the custom from time immemorial for the Chiefs of Lunawara, who are of the purest Rajpoot blood, to take their brides from certain clans in Meywar and Marwar, which clans decline to give any dowry with their daughters. Nothing will induce the Chiefs to take their wives from any other source ; and consequently, although this State was in a very impoverished condition, a further expenditure of at least 4,000% was about to be incurred in the marriage of the young Rajah. He was, during the year under report, at the Rajkumar College ; notwithstanding the cost of his education the counterbalancing advantages were so great that it was considered that nothing but the direst financial necessity could justify his removal.

Sachin.

Of Sachin (in the Surat Agency) it is reported that the survey was completed, vaccination made fair progress, and there was an entire absence of serious crime.

Junjeera.

In Junjeera the year was characterised by the almost entire absence of crimes of a serious nature. The civil courts were placed on a satisfactory footing, and were much resorted to. The stimulus given in the previous year to education by the establishment of superior schools was followed up by continued energy in the year under report.

Sattara.

There was very little to report in regard to the petty State of Akulkote and the several jaghires under the control of the Political Agent of Sattara. Something was done towards securing better accommodation for prisoners, and also for the improvement of communications. Education made some, but very slow, progress ; although not of a high order, it was stated to be sufficient for the wants of the people. The most important, however, of all the measures of the year was the decision to introduce a survey and settlement into the Bhor

territory; this will be a very great boon to the people, as it will do away with many obnoxious imposts and other grievances under which they now suffer. The survey is to be conducted by officers of Government, and is in substitution of one that had been undertaken by the Chief, but was found to be untrustworthy. The management of the Bhor State was unfavourably reported on, particularly the administration of criminal justice. The affairs of the Juth State were well and ably managed by the Assistant Political Agent. Many reforms were introduced, the most important of which was the balancing of the accounts.

The number of offences in Kolhapore was about the same as in the previous year, but there was an increase in the more serious crimes. The total receipts of the State amounted to nearly 310,000 ₹ , and the expenditure to 290,000 ₹ . On public works nearly 40,000 ₹ was expended. The municipal income of the capital amounted, including surplus funds in hand, to 5,834 ₹ . The improvement of the town was in progress, but much still remained to be done. The construction of a general drainage and of a new market were under consideration. Kolhapore.

Irrigation works were in contemplation; roads were being opened up towards Pandharpur and the grain-producing districts eastward, while a route for produce to the coast was being led over the ghâts.

Cotton, tobacco, and sugar-cane form together about 7 per cent. of the total cultivation of Kolhapore, and contribute largely to its wealth; but jowari and rice are the staple products.

There was an increase of over 2,000 in the number of vaccinations. The schools were reported to be efficient, but there was one less in number, and the attendance had also somewhat diminished.

The general results of the administration of the Sawunt Waree State appear to have been of a satisfactory character. Except in the offence of salt-smuggling, the criminal returns contrasted favourably with those of the preceding year. A decided improvement was reported in the popular feeling with regard to education. The attendance increased, and was more regular, and six new schools were opened, partially supported by the State. Sawunt Waree.

The reports of the Southern Mahratta Jaghires show a steady progress in all branches of administration. The results in the Sangli State were highly satisfactory; the inefficiency and bad behaviour of the Chief were made up for by the intelligent and efficient services of the minister. A municipality, which had existed nominally for some years past, was put on a proper footing, and it was anticipated that the income would amount to about 1,000 ₹ a year. Another jaghire highly spoken of was Mudhol. Southern Mahratta States.

The finances of most of the States were in a prosperous condition, and a fair share of the revenues was devoted to useful public works. Criminal justice was well administered, and there was a general absence of serious crime. In Sangli there was a decrease in the more serious crimes, but a marked increase in offences against person and property. Seven new schools were opened in Sangli, and five in the other jaghires. In vaccination also there was, on the whole, considerable progress.

The aggregate income of municipalities in Mysore was 37,552 ₹ , against 36,487 ₹ * in the previous year. The receipts from octroi amounted to 15,557 ₹ . Mysore.

There was a decrease of crime generally. Dacoities, however, again rose, namely, from 39 to 41, and there was a slight increase in the number of murders and of robberies. More than half of the latter occurred in the Nagar Division. The number of juvenile convicts fell from 159 to 71, and that of prisoners above 60 years of age from 209 to 89.

There was some improvement in the working of the police, as shown by the per-centage of convictions to arrests, but they exhibited considerable deficiency in detective ability. A great improvement appeared in the number of men punished during the year. There were at the close of the year 745 officers and 1,319 men able to read and write, against 520 and 1,186 in 1874.

Of prisoners received into jail during the year, 13·5 per cent. were able to read and write, while among those who were discharged the proportion was 19 per cent. Of those released after more than six months' imprisonment the proportion who had received instruction was 64·2 per cent., a very satisfactory rise upon the ratio of 38 per cent. in 1874.

The amount of civil litigation increased, as it had done steadily for several years past. The average value of the suits was 10 ₹ 6s. Nearly three-fourths of the total number were uncontested.

In the demand on account of land revenue there was an increase of 2,696 ₹ .

* The amount was stated in last year's Report (p. 89) as 52,285 ₹ , but that included the opening cash balance. The proportion derived from octroi (15,792 ₹) referred only to the income of the year.

The rainfall amounted to only one-half of that of the previous year, and about two-thirds of the average of the past five years, and the evil was aggravated by the fall being in many places unseasonable. The scanty rainfall raised the price of food-grains in some parts, and caused distress among the poorer classes.

In the State forests 1,057 additional acres were planted during the year; 50 acres were added to the teak plantations, 93 to timber, 46 to sandal wood, and 868 to fuel plantations.

With regard to irrigation, the expenditure on original works continued steadily to increase, and amounted in 1875-76 to 34,106*l*.

The total number of deaths from all causes in Mysore was much the same as in the previous year. The deaths from cholera rose from 2 to 3,139. On the other hand, small-pox, which in 1873 and 1874 respectively had numbered 3,052 and 1,535 victims, showed a further marked decrease in 1875, when the casualties amounted to 544 only.

Some important measures were introduced in connexion with education; amongst others, the constitution of a Central College and the affiliation to it of collegiate schools in each division. The School of Engineering and Natural Science was noticed in the last Report (p. 90).

The outbreak of cholera was a great check to education. Many masters died, and also students at normal schools, which were deserted in a panic. Several large schools had to be closed for a time, until public alarm was allayed. Notwithstanding these drawbacks, however, there was an increase of 31 Government and 5 aided schools, while the total number of pupils advanced from 31,577 to 36,309, or at the rate of 15 per cent.

At the higher schools an increased rate of fees was adopted without being followed by any falling off in the attendance.

The unaided schools also increased by 14, but the number of scholars slightly diminished. It is computed that the proportion of the population under instruction is 1 in 93.

With the object of encouraging the building of suitable premises in villages for primary schools, inducements are held out by Government in the way of sharing the expense of timber and providing school furniture, and in consequence many buildings have been erected either by some wealthy man at his own expense, or by subscriptions among the inhabitants.

Cochin. In Cochin the land revenue amounted to 61,572*l*., which was slightly less than in the previous year. With the exception of some land lying in the bed of the Trichoor Lake, the assessments are virtually permanent. The salt revenue declined, as it had done in the year before; the reason for this has not been ascertained. The returns indicate that the consumption has greatly fallen off, probably in consequence of the increased price.

The progress of education is said to be very satisfactory. A First Arts class was established in the High School, and the teaching staff was strengthened.

A new dispensary was opened in Trichoor in a commodious building.

The public works department was also efficiently conducted. The Cochin Government always readily undertakes its share of any joint works proposed by the British authorities.

A census which was carried out in Cochin during the year gave the population at 601,114, against 399,056 returned 17 years previously. The proportion of Christians was greater by 3 per cent. than in Travancore; they almost monopolise the boating and fishing industry. The density of the population was shown to be 441 to the square mile. The chief support of the people is the coco palm, which grows luxuriantly on the seashore and backwaters.

Travancore. The revenue of the Travancore State during the year ending 15th August 1875 amounted to 553,164*l*., the highest figure ever reached, and larger than that of the preceding year by 18,551*l*. The amount of the land revenue was 169,777*l*. There was a great demand for coffee land, and the average price per acre rose from a nominal rate to Rs. 28. Under customs revenue there was an increase, notwithstanding the abolition of the export duty on coffee. The latter measure was balanced by an increase in the land-tax on coffee lands. The salt revenue showed a very considerable increase, owing partly to the raising of the price and partly to increased consumption. Cardamoms are a very profitable source of revenue, the amount of which, however, fluctuates very much with the seasons; it ranged during 10 years from 6,000*l*. to 40,000*l*., and in the year under report it amounted to 17,290*l*.

The expenditure on education in this State is very liberal. There was a small increase in the number of pupils at the Trevandrum College and High School, and the results in the higher grades of the University examinations were very satisfactory. Female education receives a good degree of attention both from the Maharajah and from missionaries. The former maintains a girls' school, in which the instruction is in English, and which numbers 66 pupils, and is reported as very efficient. In addition to several other mission schools, one in the Fort of Trevandrum, which is largely aided by the Maharajah, supplies an excellent education to a large number of high-caste girls.

The Maharajah's hospital at Trevandrum is stated to be an admirably managed institution, and is much resorted to by high-caste patients. Another useful institution in the same town is the Charity Hospital, which is also partly used as an almshouse.

In this State, too, a census was taken, the population being returned at 2,311,379, as compared with 1,262,647 and 906,587, which were the results of enumerations in 1854 and 1816 respectively. Upwards of 20 per cent. of the population were found to be Christians, whereas in the British portion of the Madras Presidency the proportion is $1\frac{1}{2}$ per cent. The majority were Syrian Christians (295,770); next came Roman Catholics (109,820); then Protestants (61,284).

XIV.

FRONTIER RELATIONS.

FRONTIER
RELATIONS.
North-East
Frontier.

Beyond the Northern Arakan frontier the usual condition of violence and dissension prevailed; the raids were more numerous, and in some cases more serious, than those of the preceding year. Nine cases were reported of rapine and bloodshed, in which 21 lives were lost and 177 captives were taken. It has not been the policy of Government to interfere with the non-tributary tribes beyond our administration, except in so far as anything can be effected by friendly intercourse and admonition. The Chief Commissioner notices with regret that the visits of the border Chiefs appear to be getting less frequent, and to be made yearly by the same men. The Mros seem the worst of the marauders. On the 16th of November they attacked two villages within our own jurisdiction. Seven women and five children were carried off and one man was speared to death. Retaliatory violence was thought inadvisable, but efforts were made to recover the captives. It was alleged as an excuse by one of the principal Chiefs concerned that the plundered villages had only recently come under our protection, and that the raiders were ignorant of the fact, and he was profuse in promises of better behaviour in future; in the preceding year, however, a similar raid occurred on the same villages because it was known that they were about to remove within our frontier.

This foray is the first which has occurred during the past three years, and a change of police station has been made to ensure the villagers in this quarter against any future aggression.

In striking contrast to the state of things beyond was the peace and goodwill that prevailed within our borders. Improvement was observed in all directions. One of the most satisfactory features was the successful working of the Civil Dispensary, where there was an increase of attendance from 404 to 1,441. The hill tribes, it is stated, have learned to confide in our system of medical treatment, and form by far the largest portion of the patients.

One whole tribe (the Chaws), and whole villages of other tribes, placed themselves within our administrative boundary during the year. Amongst the latter were several villages of the Khoons, together with the Chief of that tribe. In former years the Khoons were quite as troublesome as the Shindoos, in whose raids they almost invariably joined.

In the Munnipore report for 1875-76 an account is given of four raids by Angami Nagas on that territory, in which 106 persons were killed, houses were sacked and fired, and a large amount of property was carried off. In one case the attacking party was more than 1,000 in number, and had 80 or 90 muskets with them. It is a question whether some retributory action may not have to be taken.

North-West
Frontier.

The Punjab frontier from Hazara to Sind was, with one exception, peaceable and orderly throughout the year, and more so than in any other year since the annexation of the province. That exception was on the Kohat border, where the refusal of some sections of the Afreedee tribe to consent to the repair of the military road through the Kohat Pass led to the blockade of the whole of the Pass Afreedees. One important section subsequently submitted.

The differences with the Akazai tribe, mentioned in the last Report (p. 93), were satisfactorily settled, and some of the tribe subsequently took service in the Punjab police. Friendly relations were also entered into with other tribes.

Arrangements made in the previous year for securing the better administration of the Tonk Valley, which had long been notorious for border crime, worked satisfactorily. The independent tribes are now encouraged to address the British authorities direct in all matters affecting their interests, and the outrages which formerly were of constant occurrence have now completely ceased.

India Office,
30th July 1877. }

HENRY HILL.

REPORT

TO

THE SECRETARY OF STATE FOR INDIA IN COUNCIL

ON

RAILWAYS IN INDIA

NOTE.

The first foot note on page 23 should read thus :—

“The earnings of the Bombay, Baroda, and Central India Railway Company
“ would also have been larger, but for an outlay of 49,768*l.* from revenue for
“ repairs to the Nerbudda and Saburmuttee Bridges.”

GOVERNMENT DIRECTOR OF THE INDIAN RAILWAY COMPANIES.

Presented to both Houses of Parliament by Command of Her Majesty.



LONDON:

PRINTED BY GEORGE EDWARD EYRE AND WILLIAM SPOTTISWOODE,

PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.

FOR HER MAJESTY'S STATIONERY OFFICE.

1877.

CONTENTS.

Subject.	Paragraph.	Page.
General progress in 1876 - - - - -	1-15	3, 4
Flood damages - - - - -	16-18	4, 5
Extensions - - - - -	19-22	5
Length of each undertaking and extent opened (tables) - - -	23, 24	6, 7
Conference - - - - -	26, 27	7
Military capabilities of the metre gauge lines - - - - -	28-31	8
Approved roads - - - - -	32-34	9
Police cases - - - - -	35	9
Proceedings in this country, shipping, &c. - - - - -	36, 37	9-11
Persons employed on the railways - - - - -	38-42	13
Children of Europeans and their education - - - - -	39	13
Native servants - - - - -	43	14
Accidents - - - - -	44-50	14-16
Capital (tables) - - - - -	51-56	17-22
Revenue - - - - -	56-67	22-25
Guaranteed interest - - - - -	68-71	26-27
Traffic (tables) - - - - -	71-95	28-45
Summary - - - - -	96-108	46, 47



REPORT.

To the Most Honourable the MARQUIS of SALISBURY, &c., &c.

MY LORD MARQUIS,

India Office, June 1877.

I HAVE the honour to lay before your Lordship my seventeenth Annual Report on the progress and working of the Indian Railway system.

2. During the year 1876, 479 miles of new line were opened for traffic. The whole extent now completed is 6,948 miles. Of these, 767 are constructed with a double, and 6,179 with a single line; 5,748 are on the 5 ft. 6 in. gauge, 1,162 on the metre, $27\frac{1}{2}$ on a four feet gauge, and 20, in the Guicowar of Baroda's territory, on a 2 ft. 6 in. gauge. Progress in 1876.

3. The lines opened since the end of 1875 comprise $297\frac{1}{2}$ miles of the South Indian Railway, which is now complete with the exception of a section, 37 miles in length, south of Cuddalore; 103* miles of the Northern Punjab State line, extending from Lahore to Jhelum; 20 miles of the Rajputana; 13 miles of the Holkar State Railway between Khandwa and Chual Choki, and between Mhow and Indore; $36\frac{1}{2}$ miles on the Neemuch State Railway, and 9 miles on the Pali branch of the Bombay and Baroda Railway. I understand also, although it has not been officially announced, that the line from Rangoon to Prome has been opened.

4. At the same time progress has been made on other lines in course of construction. It is expected that the Northern Bengal Railway will be opened some time this year to Jalpaiguri, 173 miles from Sara, the point on the Ganges from which it starts. At Jalpaiguri the line falls short of the foot of the Hills below Darjeeling by 33 miles. This gap is a serious one for traffic, and it will be very desirable to extend the railway so as to make it as serviceable as possible as well for the industries of Darjeeling as for the districts in Thibet, with which a small trade is now carried on. At its southern terminus on the Ganges it will be connected with the Eastern Bengal Railway by a ferry across the river, and by a short branch from the right bank to the station on that line. Northern Bengal line.

5. The line in Tirhoot, which was originally constructed as a temporary work during the famine season of 1874, has been made a permanent one as far as Durbanga, about 45 miles. A branch has also been thrown out from it at Somastipur to Mozufferpoor. Tirhoot.

6. The Northern Punjab line, which is being constructed on the 5 ft. 6 in. gauge is nearly complete and ready for traffic as far as Jhelum. The bridge over the Chenab between Lahore and Wazirabad was opened by His Royal Highness the Prince of Wales in January 1876. The traffic on the narrow gauge line which had been laid down between Lahore and Wazirabad has been going on during the construction of the other line. Punjab, Northern.

7. Considerable advance has been made with the works on the Indus Valley line. A length of 107 miles, extending from Moultan to Chunni Ghote, was opened for goods traffic during the dry season, a temporary bridge having been put up over the Sutlej at Adamwahan. A further length of 171 to Rohri is expected to be opened in December. From Sukkur, on the opposite side of the Indus, to Kotree, the terminus of the Sind Railway, the line is expected to be opened this month. The bridge over the Indus at Rohri has not been commenced, nor has the design yet been settled; but the permanent one over the Sutlej at the place above mentioned will be completed in March 1878. Indus Valley.

* Sixty-two miles of this line was originally constructed on the narrow gauge and used as a temporary work.

Wardha
Valley.

8. The completion of the Wardha Valley Railway in Central India is only impeded by the bridges. Mr. Armstrong, the late Chief Engineer, reported that "the whole of the Wardha Valley Railway will not be opened for regular traffic until the Wurrora and Pothra viaducts are finished. The Wurrora may be finished by July 1877, but the Pothra not before February 1878, as works can only proceed on budget grants, which are limited, and have been."

Bombay,
Baroda, and
Central
India, Dakor
branch.

9. The Pali extension of the Dakor branch of the Bombay, Baroda, and Central India Railway is an illustration of the moderate cost at which railway works may, in favourable situations, be executed. The line is 13.83 miles in length, is of the 5 ft. 6 in. gauge, and is laid with 60 lbs. rails on iron bowl sleepers. The stations are plainly built, but of sufficient size for their purpose. The total cost has been Rs. 6,14,950, being about 4,000*l.* a mile.

Nerbudda
railway
bridge on
Indore line.

10. An important link has been added to the line of communication between Central India and the North-West Provinces, *via* Indore, by the completion of the bridge over the Nerbudda river. This is the third railway bridge over that river, and was opened on the 5th October by Maharajah Holkar, who promoted the undertaking in the first instance by advancing 1,000,000*l.* to the Government at 4½ per cent. per annum. The first stone of the bridge was laid by Lord Northbrook in December 1872.

Railway
works in
Southern
India.

11. In Southern India, besides the progress made on the South Indian Railway, certain famine relief works have been going on. Among these are included the doubling of the line between Madras and Arcot, where the north-west and south-west lines join, and the earthworks for an extension of the Arcot and Conjeeveram branch of the South Indian line to Chingleput, where it will be connected with that Company's main system. Towards Bombay also, in the Dekkan, a chord line extending from Dhond on the south-eastern line to Munmar on the north-eastern line of the Great Indian Peninsula Railway has been made as a relief work, but it is not likely to be carried out to completion at present.

Nawab of
Rampoor's
offer.

12. Another example has been given of the desire of a Native Chief to encourage railway extension. The Nawab of Rampore has offered to contribute half the capital for the construction of a line from Moradabad to Rampore, on condition, however, that the Government will guarantee 5 per cent on the amount paid by him, and that he is not expected to build bridges over the Ramgunga and Kosee rivers.

Steamer
service
between
Goalundo
and Dacca.

13. In connection with the subject of railway extension, I may mention that the improvement of the steam communication between Goalundo, the terminus of the Eastern Bengal Railway, and Dacca, has occupied the attention of the Government and railway authorities, and measures have been taken for establishing a daily service by which passengers and mails will be taken from Calcutta to Dacca within 24 hours. Nothing, I regret to say, has yet been done with regard to the improvement, so much required, of the river service to Assam, notwithstanding the endeavours of the Agent of the Company to make arrangements with the Indian General Steam Navigation Company for the purpose.

Goalundo
terminus.

14. Although the encroachments of the river at Goalundo have continued (slightly as compared with former years), and a vigilant look out at a particular period of the rains was necessary in order to shift the rails and landing stages so as to accommodate the boat traffic, the prospects of the place are promising, and the population and trade increases. The arrangements for the railway station are of a very temporary and inexpensive character, consisting of sheds and houses made of timber and bamboo, with tiled roofs.

15. The cyclone and sea wave which visited the Bay of Bengal, and produced such appalling devastation on the north-east coast and islands adjoining, did not, fortunately, proceed more north, nor reach any of the provinces traversed by the Bengal lines.

Flood
damages.
Punjab.

16. But in other parts of India considerable flood damage was done. In the Punjab, the period during which the floods continued in the Sutlej river was said to be unprecedented, a length of from 10 to 14 days occurring before any sensible subsidence took place. Two piers of the Punjab and Delhi bridge over that river were carried away on the 10th and 11th August, leaving a gap of 334 feet, and interrupting the traffic until the 12th October, when it was taken over in boats. The most economical way of repairing the damage was by extending

the revetment now existing so as to fill up the space. This was accomplished by the 12th December.

17. On the western coast, also, the Bombay, Baroda, and Central India Railway suffered severely. Twenty-five spans of the bridge over the Nerbudda were swept away on the 6th September, and three servants of the Company were drowned. The rainfall at Surat, close by, was 17 inches in 16½ hours. The engineering staff of the Company immediately set to work to restore communication, and they succeeded in doing so on the 30th October by a diversion on a low level staging. They also applied themselves to repair the broken spans, and so well were their plans organized, that the bridge was finished and opened for traffic on the 28th April. Enough, however, had occurred to show that its stability cannot be depended upon, and the repeated interruptions to traffic, which means loss of revenue, pointed to the conclusion that, both on the grounds of safety and economy, it was desirable to adopt measures for establishing a more perfect means of crossing the river. After much deliberation, it has been determined to erect a new bridge, altogether upon different principles. Instead of being supported by screw piles, and having 67 spans of 62½ feet, the bridge about to be constructed will have only 25 spans, and the superstructure, which will consist of iron girders, 187 feet 6 inches in length, will be supported by piers formed of two iron cylinders, placed 37 feet 6 inches apart, centre to centre, 14 feet in diameter, for a height of 33 feet from the bottom, and 10 feet above that. It has been designed by Sir John Hawkshaw, and a contract has been made with Messrs. Hopkins, Gilkes, & Co. for the provision and delivery in India of all the ironwork, for a sum of 148,930*l*. Other materials will come to about 30,000*l*., and it is estimated by the Agent and Chief Engineer that the cost of erection will amount to 92,500*l*. more. The materials of the old bridge will be available for minor structures in other places, and for increasing the stability of existing bridges, for there can be no doubt that other bridges on this line will have to be strengthened, and it is not improbable that the same course will be followed with regard to the present bridge over the Mhye river as has been taken with the Nerbudda.

Nerbudda
bridge on
Bombay and
Baroda.

18. The East Indian and the Great Indian Peninsula Railways have been comparatively exempt from damage. At the Calcutta terminus of the former, however, a very unexpected and unusual fall of rain occurred in January last, and caused considerable damage to goods, especially grain, which had been accumulated at the Howrah station, and which were unprotected from the weather. Compensation to the extent of Rs. 1.10.400 had to be paid to the owners. On the Bhore Ghat, on the Great Indian Peninsula Railway, several slips occurred during the rains, but they were generally of a slight character, and did not cause any accidents. Disintegration of the rock through which some of the cuttings have been made is going on, and it is necessary to keep a watchful look out during the monsoon.

East Indian.

Great Indian
Peninsula.

19. No commencement has yet been made with the continuation of the Rajputana line from Ajmere to Ahmedabad, by Pahlanpore, but it is regarded as the first new railway which is to be undertaken when the state of the finances will admit of the expenditure.

West Raj-
pootana line.

20. Nothing has yet been decided with regard to the extension to the Punjab and Delhi line at Saharunpore of the Oudh and Rohilkund Railway, the northern terminus of which is now at Moradabad. Several alternative routes have been examined, and plans and estimates prepared for each. The whole subject is, therefore, in a position to be fully considered, and is now engaging the attention of the Government of India. One route, *viâ* Nujeebabad, Hurdwar, and Roorkee, is 128¾ miles in length, and is estimated to cost Rs. 1,58,59,314. Another, *viâ* Nujeebabad and Roorkee, leaving Hurdwar to the north, is 114½ miles, and is estimated to cost Rs. 1,43,43,762, and a third, *viâ* Nugeenah, Keerutpore, and Roorkee, is 114⅓ miles in length, and is estimated to cost Rs. 1,33,98,886. This last would cross the Ganges at Balawala.

Oudh and
Rohilkund
extensions.

21. At the Benares end, the extension of the line by tramway to the river bank from the cantonment, has been commenced, but nothing has been yet settled about a bridge across the Ganges, whereby a junction with the East Indian Railway would be effected.

22. A proposition has been made, by parties who have obtained from the Portuguese Government a long lease of the port and harbour of Marmagoa, to extend a

Projected
line from Goa
to Bellary.

line of railway, which they have agreed to make from that port to the Portuguese frontier, to Bellary through Dharwar, New Hooblee, Judduck, and Copal. They ask for the grant in perpetuity of all land that may be required for the railway, and for permission to excavate and appropriate, on any waste land at the disposal of Government, all such stone, limestone, or earth as may be required for embankments, bridges, stations, and houses; and they offer the same concessions with respect to the conveyance of mails and troops as have been made with the Guaranteed Companies. The whole subject is now under the consideration of the Government of India.

23. The following table gives the length of each undertaking, and the extent opened on the 1st January 1877 :—

	Railway.	Gauge.	Length of Line sanctioned.	Length opened during 1876, or since.	Total Length opened.	Portion laid with Double Line.	Length remaining to be finished.
Guaranteed.	East Indian - { Main line - Jabalpur line- }	5' 6"	{ 1,280 223 $\frac{3}{4}$ }	—	1,280	410 $\frac{3}{4}$	—
	Great Indian Peninsula - -	5' 6"	1,288	—	1,288	325	—
	Madras - - - -	5' 6"	858	—	858	3 $\frac{1}{2}$	—
	Bombay, Baroda, and Central India -	5' 6"	417	9	417	23 $\frac{1}{4}$	—
	Scind, Punjab, and Delhi - -	5' 6"	663 $\frac{3}{4}$	—	663 $\frac{3}{4}$	4 $\frac{1}{2}$	—
	South Indian - - -	3' 3 $\frac{3}{8}$ "	617 $\frac{3}{4}$	297 $\frac{1}{2}$	580 $\frac{3}{4}$	—	37
	Eastern Bengal - - -	5' 6"	159 $\frac{3}{4}$	$\frac{3}{4}$	158 $\frac{1}{4}$	—	1 $\frac{1}{2}$
	Oudh and Rohilkund - - -	5' 6"	711	—	544 $\frac{1}{4}$	—	166 $\frac{3}{4}$
	Nalhati - - - -	4' 0"	27 $\frac{1}{2}$	—	27 $\frac{1}{2}$	—	—
	Calcutta and South-eastern - -	5' 6"	28	—	28	—	—
	Northern Bengal - - -	3' 3 $\frac{3}{8}$ "	373	—	—	—	373
	Punjab Northern - - -	5' 6"	267 $\frac{1}{2}$	103	103*	—	164 $\frac{1}{2}$
	Indus Valley - - - -	5' 6"	508	—	—	—	508
	Rajputana (Agra and Delhi to Nasirabad) - - -	3' 3 $\frac{3}{8}$ "	400	20 $\frac{1}{4}$	400	—	—
	Neemuch (Indore to Neemuch) -	3' 3 $\frac{3}{8}$ "	303 $\frac{1}{2}$	36 $\frac{1}{2}$	36 $\frac{1}{2}$	—	267
	Indore to Khandwa (Holkar's) -	3' 3 $\frac{3}{8}$ "	85 $\frac{1}{2}$	13	70	—	15 $\frac{1}{2}$
State.	Patri branch of Bombay, Baroda, and Central India Railway -	5' 6"	22 $\frac{1}{2}$	—	22 $\frac{1}{2}$	—	—
	Wurdha Valley - - - -	5' 6"	46 $\frac{1}{2}$	—	18	—	28 $\frac{1}{2}$
	Tirhut - - - - -	3' 3 $\frac{3}{8}$ "	93	—	45	—	48
	Rangoon and Irrawaddy Valley -	3' 3 $\frac{3}{8}$ "	367	—	—	—	367
	Sindia (Agra to Gwalior) - -	5' 6"	72	—	—	—	72
	West Rajputana - - - -	3' 3 $\frac{3}{8}$ "	314 $\frac{3}{4}$	—	—	—	314 $\frac{3}{4}$
	Nagpur and Chattisgarh - - -	3' 3 $\frac{3}{8}$ "	123 $\frac{1}{2}$	—	—	—	123 $\frac{1}{2}$
	BERAR.						
	Khamgaon - - - - -	5' 6"	7 $\frac{1}{2}$	—	7 $\frac{1}{2}$	—	—
	Amraoti - - - - -	5' 6"	5 $\frac{1}{2}$	—	5 $\frac{1}{2}$	—	—
	NIZAM'S GOVERNMENT.						
	Wadi to Hyderabad and Secunderabad	5' 6"	121	—	121	—	—
	PROVINCIAL.						
	Muttra and Hathras - - - -	3' 3 $\frac{3}{8}$ "	30	—	30	—	—
	Gakwar of Baroda's, from Iniagam to Dubhee - - - -	2' 6"	20	—	20	—	—
Total - - - - -			9,435 $\frac{1}{4}$	479 $\frac{1}{2}$	6,948 $\frac{1}{4}$	767	2,487

* In lieu of 62 miles of temporary line.

Military
capabilities
of the metre
gauge lines.

29. In January last a Committee, of which Brigadier-General H. R. Browne was President, was appointed by the Government of India to report on the military capabilities of the metre gauge railways. The Committee met at Agra, where experiments with metre gauge vehicles were carried out. They found that a first class passenger carriage would convey nine officers seated or four lying down; a second class, 18 officers or men seated or 12 lying down; a third class, 24 European or Native soldiers, in marching order, or 32 followers; that covered goods or cattle waggons would accommodate 12 British or Native soldiers in marching order with kits, or eight British with kits and one E. P. tent, or nine sepoy's with kits and half-company pâl; that either of these waggons would convey 80 kits of British or Native soldiers packed in suleetahs in the usual way, or eight tents E. P. pattern, kettles, and equipment complete (with the exception of the poles, which must be lashed on the roof or placed on an open truck), or 16 sepoy's pâl's complete. The ordinary horse-boxes or cattle waggons admitted, they found, two horses with ease and a third on emergency, if the animals are quiet and properly attended to. In the open trucks the accommodation would be the same, if the horses are placed longitudinally, but if standing transversely four may be embarked in the same waggon. This arrangement, however, is not free from risk of accident, in consequence of the heads of the animals protruding beyond the sides. A new class of waggon of increased length, suitable for four horses, is being introduced. Bullocks, they observe, are steadier and less liable to frights than horses, and may therefore be more safely conveyed in the goods waggons. Three large or four small draught bullocks may be placed in a covered goods waggon, and four to six in open waggons 13 ft. 6 in. in length, fitted with temporary side rails.

30. In reply to the question, "Can a siege train be conveyed?" the Committee say, "There is no difficulty in conveying the heaviest ordnance in use in Indian siege trains on the metre gauge, or in loading and unloading it from ordinary station platforms," and "at all places where break of gauge occurs, heavy ordnance may be transferred from the waggons of one line to those of another with great facility, by using the travelling or fixed cranes belonging to the railway, the rate of transfer, with a single crane, averaging 15 to 20 minutes for each heavy gun, with its carriage and limber." With reference to the conveyance of a heavy field battery (40-pounder Armstrong, &c.), they are of opinion that no difficulty would occur in its transport, and that it would require 136 vehicles, consisting of 1 first class carriage, 16 third class, 78 horse or cattle trucks, 33 low-sided trucks, 7 covered goods waggons, and 1 ammunition van.

Alterations
necessary in
existing
vehicles.

31. These opinions are the result of careful experiments, which were conducted under the directions of the Committee. In order to make the rolling stock on the railways as available as possible for military purposes, certain alterations will be necessary, both in the 5 ft. 6 in. and the metre gauge waggons, and these can be carried out by degrees as repairs and renewals are required, without detriment to the vehicle as a conveyance for merchandise. The expense—estimated at 150,000*l.*—would be too large to be incurred at once. The expediency of considering the suitability of the railway permanent way and stock for military stores and ordnance is exemplified by the break down which has occurred on the Roumanian railways, in consequence of the heavy pressure of the war traffic.

Approach
roads to rail-
way stations.

32. Complaints continue to be made of the absence, in many parts of the country served by railways, of approach roads to the stations. The advantage of these communications, both to the districts and to the railways, is fully acknowledged, and the Government of India has urged "upon Local Governments and Administrations, and upon the rulers of Native States, the utmost possible efforts in respect to feeder roads," recommending that if the funds at the disposal of these authorities are too limited to meet all demands for public works, preference should be given to roads over civil buildings, inasmuch as the money spent upon the former will contribute to the remunerativeness of railways and repay itself. In a recent Despatch from your Lordship to the Viceroy, these views are fully endorsed, and the trust is expressed that the Government "may find it possible to take such steps as shall at all events secure the opening out and maintaining in proper condition approach roads to all railway stations where they do not now exist, and that no considerable delay may be permitted to occur before this very essential object is attained."

33. The Chief Engineer of the Oudh and Rohilkhund Railway, at the last inspection of the line, called attention to the fact that small villages were springing up just outside many of the station premises, and suggested "that some system should be observed in their construction, and that they should be under some control as to sanitary arrangements." The subject is one worthy of consideration, not only in Oudh, but in other parts of India. The Government Consulting Engineer supported the proposition, and further suggested that "the houses should be tiled, and not thatched, as there is some danger of sparks flying that distance."

Station
villages.

34. Arrangements have now been made with all the Companies, excepting the Great Indian Peninsula, for transferring to the Government their telegraph systems, such wires being left for the use of the railways as are required for the working of the traffic.

Transfer of
telegraphs to
Government.

35. In the report of Captain Portman, Superintendent of Police for the Bombay, Baroda, and Central India Railway, illustrations are given of the various offences committed on railways in India. Two cases of dacoity are mentioned, consisting of night attacks upon stations for the sake of plunder. There is a case of robbery by a female, who administered to a fellow passenger a powerful narcotic, which she described as a "pussad," or sacred sweet, and was taken as such by her victim. She was found asleep in the carriage, deprived of her ornaments and money. Thefts and embezzlement under false declaration of goods are sometimes practised. Bags of gunpowder are despatched as groceries, and opium is smuggled in oil jars, the drug being packed between narrow receptacles for oil one passing through the middle of the jar and another just inside the covering. Opium is also sent in bags, described as containing gum, glue, &c.

Police cases.

36. There have been changes in the heads of the staff of several of the railways during the year. In consequence of the lamented death of Mr. Cecil Stephenson, who had done good service for many years on the East Indian Railway in various positions, and lastly as Agent, and also the retirement of the able Chief Engineer, Mr. George Sibley, Mr. Bradford Leslie was selected to fill the joint office of Agent and Chief Engineer. Mr. Charles Currey, the very efficient Agent of the Bombay, Baroda, and Central India Railway, having accepted the post of Secretary to the Company in London, in succession to the late Mr. Baynes, Mr. F. Mathew, the zealous and energetic Chief Engineer in India, was appointed Agent as well. The retirement of Mr. Harrison, after many years' good service as Chief Engineer and acting Agent of the Sindh, Punjab, and Delhi Company, was followed by the appointment to the agency of Mr. Roscoe Bocquet, the Locomotive Superintendent. On the Great Indian Peninsula Railway also, Mr. H. P. Le Mesurier, C.S.I., who was formerly Chief Engineer in the Jubbulpore line of the East Indian, and did good service in the Punjab during the mutiny, resigned the appointment of Agent which he had held for some years, to become a member of the Railway Commission in Egypt. The Auditor, Mr. Barnett, is now acting as Agent.

Indian staff.

PROCEEDINGS IN THIS COUNTRY.

37. The following tables exhibit the shipping operations of the Companies and the Government in this country :—

SHIPPING OPERATIONS, exclusive of Fuel, during 1876, on Account of Guaranteed and State Railways.

Railway.	Number of Ships employed in 1876.	Number of Tons of Goods shipped in 1876.	Value of Goods shipped in 1876.	Amount paid for Freight and Insurance in 1876.	Average Rate of Freight and Insurance per Ton.
		Tons.	£	£	£ s. d.
East Indian - - -	64	31,706	239,035	30,009	0 19 0
Great Indian Peninsula - - -	118	135,228	178,558	158,676	1 3 5½
Madras - - -	28	9,362	85,439	12,065	1 5 9
Bombay, Baroda, and Central India - - -	47	8,200	66,279	11,606	1 8 4
Scinde, Punjab, and Delhi - - -	19	2,091	49,885	5,492	2 12 6
South Indian - - -	30	13,536	131,568	18,596	1 7 5
Eastern Bengal - - -	18	933	6,258	1,087	1 3 3
Oude and Rohilkund - - -	37	5,448	136,043	9,254	1 14 0
State Railways - - -	226	90,297	680,929	111,342	1 4 8
Total - - -	587	296,801	1,573,994	358,127	—

AMOUNT and COST of COAL and other FUEL sent out from this Country in 1876.

Railway Company.	Number of Tons supplied from England.			Total original Cost.			Sum paid for Freight and Insurance.	Average Cost of each Ton when bought in England.			Average Cost of each Ton delivered in India.		
	Of Coal.	Of Coke.	Of Patent Fuel, &c.	Of Coal.	Of Coke.	Of Patent Fuel, &c.		Of Coal.	Of Coke.	Of Patent Fuel, &c.	Of Coal.	Of Coke.	Of Patent Fuel, &c.
				£	£	£	£	£ s. d.	s. d.	s. d.	£ s. d.	s. d.	s. d.
East Indian - - -	—	883	—	—	2,153	—	—†	—	48 9	—	—	—	—
Great Indian Peninsula - - -	118,666	—	—	68,428	—	—	131,756	11 6½	—	—	33 9	—	—
Madras - - -	—	1,781	—	—	1,514	—	12,640	—	17 0	—	—	47 2½	—
Bombay, Baroda, & Central India - - -	20,922	—	—	34,288	—	—	—†	1 13 9	—	—	1 13 9	—	—
Scinde, Punjab, and Delhi - - -	5,876	97	*112	9,416	309	—	—§	—	32 1	65 8	32 1	63 8	—
South Indian - - -	19,272	305	—	10,856	241	—	18,848	11 3	15 10	—	33 0	39 6	—
Eastern Bengal - - -	200	100	—	152	136	—	173	15 3	27 3	—	24 9	42 11	—
Oude & Rohilkund - - -	—	—	—	—	—	—	—	—	—	—	—	—	—
Totals - - -	164,936	3,166	112	123,140	4,353	—	—	—	—	—	—	—	—

* Sample to be paid for on approval. † Included in cost of coke. ‡ Included in price of coal. § Included in original cost.
 || This price includes all charges until delivery is taken from the sides of the ships at Madras. The landing charges are about 3s. a ton.

SHIPMENTS FROM THE COMMENCEMENT.

Period.	Number of Ships employed.	Number of Ships lost.	Number of Tons of Goods shipped.	Amount paid in England for Goods shipped.
				£
Up to end of 1860 - - -	2,605	39	2,094,686	10,431,976
In 1861 - - -	407	—	181,621	1,669,443
„ 1862 - - -	280	1	138,013	1,487,582
„ 1863 - - -	279	2	166,840	1,285,464
„ 1864 - - -	233	—	102,318	1,018,164
„ 1865 - - -	442	2	199,157	1,729,543
„ 1866 - - -	581	7	312,227	2,527,757
„ 1867 - - -	512	5	333,329	3,052,652
„ 1868 - - -	364	3	188,858	1,849,554
„ 1869 - - -	455	1	211,750	1,432,784
„ 1870 - - -	461	1	263,449	1,688,209
„ 1871 - - -	307	6	168,049	707,765
„ 1872 - - -	318	1	66,534	655,822
„ 1873 - - -	404	2	201,590	1,561,602
„ 1874 - - -	426	5	265,114	2,042,136
„ 1875 - - -	421	—	288,186	1,518,991
„ 1876 - - -	587	—	296,801	680,929
Total - - -	9,082	75	5,480,525	35,340,373

38. The proprietors have increased in number from 62,608 to 63,228. The insignificant number of those who held stock or shares in India has become still less, owing to purchases for transfer to the Home Registers as a remittance: the Europeans being reduced from 407 to 293, and the Natives from 390 to 367. The proportion of stock held in India is about 1·50 per cent. of the whole.

Railway.	Number of Shareholders on 31st December 1876.						Number of Debenture Holders.		Total Number of Proprietors on the 31st December 1876.
	Registered in England.			In India.			Bonds.	Stock.	
	With Stock or Shares to the Amount of 1,000 <i>l.</i> and upwards.	With Stock or Shares of less Amount than 1,000 <i>l.</i>	Total in England.	Europeans.	Natives.	Total in India.			
East Indian - - -	7,201	8,558	16,059	103	149	252	586	864	17,761
Great Indian Peninsula -	5,670	7,656	13,326	68	125	193	534	1,523	15,576
Madras - - -	3,145	4,257	7,402	—	—	—	24	—	7,426
Bombay, Baroda, and Central India -	2,470	3,885	6,355	9	38	47	1	—	6,403
Scinde, Punjab, and Delhi - - -	3,447	5,376	8,823	48	11	59	—	—	8,882
South Indian - - -	941	1,454	2,395	No register in India.			—	142	2,537
Eastern Bengal - - -	704	954	1,658	19	20	39	40	199	1,936
Oude and Rohilkund -	1,095	1,398	2,493	46	24	70	—	144	2,707
Total - - -	24,673	33,538	58,571	293	367	660	1,185	2,872	63,228

NUMBER of LOCOMOTIVES and VEHICLES owned by the GUARANTEED RAILWAY COMPANIES.

Railway Company.	Locomotives.			Passenger Carriages.		Goods Trucks and Waggons.		Total Number of Vehicles on 31st December 1876.
	Former Number.	Added or With-drawn in 1876.	Total Number, 31st Dec. 1876.	Former Number.	Added in 1876.	Former Number.	Added or Deducted in 1876.	
East Indian - - -	515	† - 4	511	954	28	6,664	37	7,683
Great Indian Peninsula -	345	—	345	1,312	2	6,681	- 2	7,993
Madras - - -	128	—	128	383	8	3,205	—	3,596
Bombay, Baroda, and Central India - - -	85	- 5	80	295	—	2,739	- 31	3,003
Scinde, Punjab, and Delhi -	156	—	156	509	25	2,995	- 68	3,461
South Indian - - -	* 60	+ 42	93	226	116	† 936	+ 520	1,675
Eastern Bengal - - -	43	—	43	167	+ 2	707	- 6	870
Oude and Rohilkund -	62	+ 7	69	302	+ 20	1,200	+ 294	1,816

* 9 locomotives sold to the Punjab Northern State Railway.

† 2 sold, 2 condemned.

‡ 123 goods vehicles sold to the Punjab Northern State Railway.

NUMERICAL RETURN of all Races employed on open Lines of Railways and on the Indus Flotilla on the 30th September 1876.

Railways	General Administration, including Agency, Audit, Account, Paymasters' Stores, Medical, Barrack, Printing, Stationery, and Police Establishments.				Traffic and Telegraph Departments.				Engineers' Department.				Locomotive and Carriage and Wagon Departments, including Steamboat Establishment.				Total.				Number of Miles Open.	Number of Stations.	Remarks.
	Europeans.	East Indians.	Natives.	Total.	Europeans.	East Indians.	Natives.	Total.	Europeans.	East Indians.	Natives.	Total.	Europeans.	East Indians.	Natives.	Total.							
East Indian	74	32	3,008	3,114	282	188	8,533	9,003	72	15	10,997	11,034	501	231	9,595	10,327	929	466	32,133	33,528	1,503½	155	(a.) Of these, 106 are extra men for miscellaneous work. (b.) This includes Chitpur and Koostia branches.
Eastern Bengal	15	—	683	698	67	29	2,469	2,565	12	2	(a) 1,560	1,574	61	36	1,628	1,725	155	67	6,340	6,502	(b) 1,584	33	
Oudh and Rohilkund	23	30	577	635	83	8	1,026	1,070	29	10	2,300	2,339	71	32	2,145	2,248	164	80	6,048	6,292	542½	75	
Punjab and Delhi	55	12	698	865	89	31	1,533	1,653	25	7	3,393	3,425	119	36	2,643	2,798	288	86	8,167	8,541	553½	51	
Sind (including Indus Steam Flotilla).	3	14	202	219	9	27	160	196	3	2	498	503	72	74	1,430	1,576	87	117	2,290	2,494	109½	9	
Calcutta and South-Eastern (State).	(c) 2	—	12	14	—	—	59	59	—	1	107	108	(c) 1	1	82	84	3	2	260	265	28	8	(c.) One European is only employed in the General Administration Department of these two Railways, but employees are made against each line. Exclusive of the Agency Surgeon attending Railway employees on Rajputana State Railway.
Nalhati (State)	(c) 1	—	10	11	—	—	31	31	—	—	69	69	(c) 1	—	60	61	2	—	170	172	27½	7	
Rajputana (")	21	20	327	363	32	31	661	724	29	5	2,594	2,628	65	22	706	793	147	78	4,288	4,513	394½	48	
Holkar and Neemuch (")	11	—	76	87	9	8	149	166	2	1	201	204	20	8	257	285	42	17	683	742	107	14	
Tirhut (")	6	2	52	60	2	1	126	129	19	3	261	263	8	1	134	143	35	7	573	615	45	7	
Punjab, Northern (")	10	2	84	96	13	15	43	71	2	—	80	82	12	5	70	93	37	22	283	342	103	14	
Madras	16	46	502	564	29	338	1,967	2,324	30	93	4,370	4,493	14½	421	2,879	3,445	220	898	9,708	10,826	857½	87	
South Indian	6	19	170	195	5	46	899	950	20	44	2,190	2,254	46	88	1,001	1,135	77	197	4,260	4,534	477½	61	
Great Indian Peninsula	42	29	1,087	1,158	272	263	3,619	4,154	67	42	10,004	10,113	360	136	5,971	6,467	751	470	20,681	21,892	1,966½	137	
Bombay, Baroda, and Central India.	15	34	671	720	10	53	1,464	1,563	17	2	2,046	2,065	57	154	1,159	1,370	105	343	5,370	5,718	450½	78	
Railways under the control of the Government of India.	226	112	5,029	5,967	539	338	14,790	15,667	193	46	22,000	22,299	931	446	18,756	20,133	1,589	942	61,235	64,966	3,572½	421	
Ditto ditto Madras	22	65	672	759	84	334	2,886	3,274	50	137	6,506	6,747	191	509	3,880	4,480	297	1,095	13,968	15,360	1,335½	143	
Ditto ditto Bombay	57	63	1,753	1,878	238	316	5,113	5,717	84	44	12,050	12,178	417	290	7,180	7,887	846	713	26,031	27,610	1,716½	215	
Total Indian Railways	305	240	8,059	8,604	861	1,038	22,759	24,658	327	227	40,670	41,224	1,539	1,245	29,766	32,550	3,632	2,750	101,254	107,936	6,624½	784	

PERSONS EMPLOYED ON THE RAILWAYS.

39. It appears by the foregoing returns that, out of a total of 107,036 persons employed on the 6,624 open miles of railway on the 30th September last, 101,254 were Natives, 3,032 were Europeans, and 2,750 East Indians. The number of deaths amongst the Europeans was 60 or about 2 per cent., amongst the East Indians 34 or 1·24 per cent., during the preceding twelve months.

European
and East
Indian
employés.
Casualties.

40. The Europeans, it will be seen, form only 2·83 per cent. of the whole number employed. It is not probable that this proportion will be materially reduced, and it is certain that there will always be a number of Europeans of the mechanical class who will reside many years, if not all their lives, in India, and raise a progeny there. I have not been able to obtain a complete return of the number and ages of the children now in India belonging to the European servants of the Railway Companies, but information as to these points and as to the means available for their education has been called for. We shall then be in a position to judge whether some more perfect arrangement than that which now exists may not be made for their bringing up. Not only should they receive mental and religious instruction, but their health and physical training should be attended to. There cannot be a doubt that European children who are allowed to remain in the plains of India until they reach maturity will be reduced to a feeble and flaccid condition, and that a second generation would degenerate still more. It is important, therefore, if they are to remain in India, that, both on their own account and in the interests of their adopted country, the opportunity should be given them of growing up as strong in mind and body as circumstances will permit. Where Europe is out of the question, attention will naturally be turned to one of the hill stations, as a more suitable place than the stifling towns of the plains, for the purposes of training children of this class. One or two boarding schools might, with the aid of the Government and the Companies, be established in some well selected situation, as central as possible, and the European and perhaps the East Indian railway employés would probably be glad to contribute their quota of the expense.

Children of
Europeans
and their
education.

41. Some idea of the numbers to be provided for, and of the existing means of education, may be formed by a return relating to the East Indian Railway, the only one which has been obtained. It appears from this that at 32 stations there are 940 European children, and at 42 stations 749 half-caste children, of all ages, being 1,689 in all; that schools are provided at 13 stations, and that 34 stations are without them; that at the 13 stations there are 593 European and 509 half-caste children, 1,102 in all. There are thus 347 European and 240 half-caste children who have no schools to go to, and who are dependent on parental or private teaching. The total number of European employés on the East Indian Railway is 929, and of East Indians 466, so that the average proportion of children to adults is in the case of Europeans not quite 1 per cent., and in the case of East Indians ·62 per cent. Applying the same proportion to the whole of the railway employés in India, there would be about 3,000 European children, and 1,870 East Indian, to be brought up. A considerable number of these would be infants, or under five years of age, and consequently not eligible for a public institution. But a large number still remain. We shall know the exact number when the returns called for are made. In the meantime it may be worth while to consider, in all its bearings, the whole question of the training of these Indian born English children. I may mention that doubts have already been raised as to the character of the education given. The Archdeacon of Calcutta, after visiting the railway schools in Upper India, expressed his opinion that the education given "is not up to the standard taught in the English National Schools," and he doubts whether it fully qualifies the boys "for the occupations suitable to their stations in life." At Bombay, on the other hand, the education is reported to have been fairly successful. There, boarding schools have been already established, as well as night schools for the elder boys who are engaged during the day in the workshops.

42. The Europeans composing the class to which I have been referring have generally been well conducted and steady. Their pay is good, and they are provided

Conduct of
European
servants on
the railways.

with suitable dwellings and various means of recreation and amusement. If they resist the temptation of drink, they have a fair prospect before them of competence and success. Harmony and good feeling has prevailed between the men and their superiors, but occasionally questions have arisen which have produced a little excitement and irritation. There was an example of this last year, but all misunderstanding was soon removed by tact and forbearance. In June the European guards and drivers of the East Indian Railway expressed their discontent with the arrangements under which they were employed. They complained that their pay, which was reduced when the traffic fell off, had not been restored to its former figure when the traffic improved; that they were not treated fairly with regard to overtime, Sunday allowances, promotion, &c. Meetings were held, and the men were brought face to face with Mr. Campbell. They were respectful, and he received their reasonable representations with consideration and good temper. Captain Wallace, R.E., Deputy Consulting Engineer to the Government, who had been appointed to investigate the cause of the discontent, acted also with great discretion, and was the means of bringing the matter to a satisfactory settlement. Admitted wrongs were redressed, a proper understanding was come to, and certain questions were reserved for consideration. It was also agreed that an attempt should be made to establish a uniform system of pay and allowances on all the railways. This would be very desirable, and the experience which has now been gained should not make it difficult to decide on what would be the best arrangement. The chief points seem to be to fix a reasonable rate of wages at starting, and to allow continuous good service to be rewarded by increased pay up to a proper maximum, to settle what is a fair day's work, and to guard against excessive overtime, which overtakes a man's strength, and leads to the imperfect performance of his duty. This is a subject which will, no doubt, engage the attention of the next Conference.

Provident
Funds.

43. The East Indian is the only Company which at present has contributed any of its revenue to a provident fund. On that line the fund has proved to be a great boon. The contribution is made out of the excess net profits over 6 per cent., both the Government and the Company agreeing to give up a proportionate amount of their surplus profits. The intended effect of the grant is to give every subscriber (and each servant when engaged is now compelled to be a subscriber) a personal interest in the success of the undertaking. A sum of 45,000*l.* has been contributed to the fund by the above method. The grant last year was upwards of 20,000*l.* Other Companies, it may be hoped, will likewise be in a position before long to confer a similar benefit on their officers and servants.

Native
servants.

44. With regard to Native servants, I have only to observe, generally, that careful selection in the first instance, and proper training afterwards, have produced their natural fruits. Steadiness, self-possession, and other moral qualities, of which they are usually thought to be deficient, improve, and we have now many examples of well qualified drivers and pointsmen. Their competency as skilled workmen, whether as artificers, mechanics, forgers, &c., has already been demonstrated by experience. Although requiring more skill and closer attention to work, the Native drivers and shunters appear to give more satisfaction than the guards, at least in Bengal. They are described as "strongly built men, and smart and intelligent." Mr. Campbell, the Locomotive Superintendent of the East Indian Railway, takes great pains in preparing them for their work. He is disposed to place confidence in them, and, after trial and experience, he advocates their increased employment.

ACCIDENTS.

45. The usual return of accidents for the past year has not yet been received from India. I am unable, therefore, to give more than an imperfect summary of those cases which have from time to time been reported by the Agents of the Companies. The most disastrous accident was one which occurred on the Madras line, near Amboor, at 2 o'clock on Christmas morning. The mail train and a special goods train were to have passed at that station; but the driver of the mail train, forgetting that he had to meet the special, drove through the station, at which no signal seems to have been exhibited, and came into collision with the special two miles further on. One composite, two third class, and three waggons were smashed, and 12 lives were lost, ten passengers being killed on the

spot. The driver, station master, and assistant station master were prosecuted and punished by fines and imprisonment.

46. One or two malicious attempts to injure and upset trains have been made. On the East Indian Railway a rail was removed from a culvert just before the mail on the night of the 11th August was expected. The attempt was, happily, discovered by the driver of a light pilot engine which happened that evening to be passing in front of the train. A similar attempt was made on the Eastern Bengal, and the motive was traced to be that of revenge for injury done to the crops by the railway. On the Madras and South Indian lines the same attempts were made.

47. On the Oudh and Rohilkund, damage was caused by the sparks from an engine, and an action was brought against the Company to recover the loss. Judgment was given in favour of the plaintiffs by the Assistant Commissioner before whom the case was tried, and confirmed by the Commissioner of the District, on the ground that the Company possessed no legislative power to use locomotives. Strange though this reason may appear, it seems that there was ground for it. In order that, in future, all doubts may be removed, it has been suggested that the new Railway Bill about to be introduced into the Legislative Council for consolidating all existing Acts relating to Indian Railways should contain a clause by which the power to use locomotives on railways should be distinctly given.

48. On the South Indian, a child fell out of a carriage while the train was in motion. The mother jumped out after it, and both were picked up uninjured. On the same line, a cow-catcher was the means of saving a human being. A Native woman, who afterwards said she was tired of life, placed herself between the rails just as a train approached. She was caught up by the cow-catcher, and pitched, unhurt, on the side of the line.

49. One fatal accident occurred to a Native on the Punjab line, through his own misdemeanour. He travelled some distance on the buffer of a waggon, and on jumping off when the train was approaching a station, with a view, it is supposed, of evading payment of his fare, was run over and killed.

50. Although unable to give more than the summary contained in the subjoined table, I am able to say, judging from the detailed returns relating to one or two lines, that the system of reporting and investigating accidents is very complete. Whether it be that a cooly employed in carrying materials or in excavating gravel is injured, that a workman is hurt in the shops, that a bungalow takes fire, that injectors of an engine fail or a rod breaks, each case is noticed and reported as carefully as when a serious collision takes place or when a train is derailed. And this is quite right as a rule. The nature of an accident is apt to be judged solely by its actual results; but the grossest blunder may be less serious in its effects than a trivial mistake. A loose rail or an imperfect tyre may cause greater loss of life than the gap in a bridge or a collision between two trains. A signaller may give a wrong signal, and an accident may only be averted by the watchfulness of the driver. The investigation of an accident should have reference to the future as well as to the past, the object being to provide prospective safeguards as well as to detect blunders or neglect of duty. It becomes, therefore, often quite as important to inquire into what are regarded as trivial accidents and narrow escapes, as to take up the more serious cases. Nor should those which happen so frequently to passengers, and especially to railway servants, through causes within their control, be passed over, for even while individual sufferers may be at fault, checks might be used against negligence and recklessness on their part.

ACCIDENTS to PERSONS during the Year 1876.

	Passengers Killed or Injured from Causes beyond their control.		Passengers Killed or Injured from Misconduct or Incaution.		Railway Servants Killed or Injured from Causes beyond their control.		Railway Servants Killed or Injured from Misconduct or Incaution.		Persons Killed or Injured at Level Crossings.		Trespassers.		Miscellaneous.		Total.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
East Indian Main -	1	6	9	22	5	1	15	31	—	1	46	4	2	6	78	71
Jubbulpore -	—	3	1	1	—	1	2	—	—	—	3	1	1	—	7	6
Great Indian Peninsula -	—	—	1	2	8	30	8	33	2	—	4	2	4	8	27	75
Madras -	10	13	1	5	1	4	9	18	1	—	3	3	2	1	27	44
Bombay, Baroda, and Central India.	—	5	—	1	1	15	7	8	—	1	3	1	1	1	12	32
Scinde, Punjab, and Delhi -	—	—	1	2	—	—	11	18	—	—	—	—	1	1	13	11
South India -	—	—	—	3	—	2	—	15	1	—	1	—	—	—	2	20
Eastern Bengal -	—	—	*1	1	1	—	3	5	—	—	1	1	1	1	7	8
Oudh and Rohilkund -	—	—	1	1	—	—	5	10	—	—	9	2	1	1	16	14
State Lines (no returns).	11	27	15	38	16	53	60	128	4	2	70	14	13	19	189	281

* Drowned from a steamer.

CAPITAL.

51. During the year 1876-77, the capital expenditure on the guaranteed railways was 879,665*l*. The accounts of the State lines have only been received up to the end of October last. At that time a sum of 2,946,947*l*. had been expended on them since the 1st January 1876. It may be estimated that by the end of the year a further sum of 553,053*l*. had been appropriated to works in hand, making a total of about 3,500,000*l*. for the year. The greater part of the expenditure of guaranteed capital took place on the extensions of the South Indian, to which line, as before stated, nearly three hundred miles were added. On most of the railways very little was spent, and with regard to some, the total amount has been reduced by the sale of stores to other lines, as well as the transfer to revenue account of the value of such as were required for working and maintenance purposes.

52. During the current year more capital will be required on the open lines for the purchase of an additional stock of locomotives and waggons to meet increased traffic, and for the new bridge over the Nerbudda river on the Bombay and Baroda Railway. The development of the resources of the country which is now taking place, and the large traffic which has ensued, points to the probability of more expenditure in future years for the additional accommodation and means of transport that will be required.

53. The State lines on which the principal expenditure was incurred were the Northern Bengal, the Punjab Northern, and the Indus Valley.

54. The total amount of capital that had been expended up to the end of the year (adopting the estimate above made for the months of November and December on the State lines) was 109,364,867*l*., of which 94,272,265*l*., was on account of guaranteed, and 15,092,602*l*. on account of State lines. The details are given in the accompanying statements, prepared in the Accounts Departments of this Office.

55. The total amount of guaranteed capital that had been raised up to the 31st March last was 94,832,562*l*., of which 84,374,121*l*. consisted of share capital, 4,766,300*l*. of debentures, 5,422,458*l*. of debenture stock, and 269,683*l*. of capital not bearing interest.

56. The rates of interest paid on the several descriptions of capital, and the amounts thereof, were as follows, on the 31st March last :—

				£
Share capital	at 5	per cent.	-	82,630,969
"	" $4\frac{3}{4}$	"	-	1,243,152
"	" $4\frac{1}{2}$	"	-	500,000
Debentures	" $4\frac{1}{2}$	"	-	183,450
"	" $4\frac{1}{4}$	"	-	2,096,400
"	" 4	"	-	2,486,450
Debenture stock	" $4\frac{1}{2}$	"	-	1,925,000
"	" 4	"	-	3,497,458
Capital not bearing interest			-	*269,683
				<hr/>
				£94,832,562
				<hr/>
				£
* Premium on share capital and debentures	-	-	-	562,263
Less, discount on debenture stock, viz. :—				£
Stock represented as shown above	-	-	-	5,422,458
Cash received in respect thereof	-	-	-	5,129,878
				<hr/>
				292,580
				<hr/>
				£ 269,683
				<hr/>

STATEMENT No. 1.

STATEMENT OF EXPENDITURE IN ENGLAND AND INDIA ON INDIAN STATE RAILWAYS, appropriated to the various Undertakings as shown in Statements to 31st October 1876 (the latest date to which such Statements have been received from India).

State Railway.	Expenditure appropriated.			Classification of Expenditure.												Receipts on Capital Accounts.
	England.	India.	Total.	Pre-liminary Expenses.	Land.	Construction of Line.	Ballast and Permanent Way.	Stations and Buildings.	Electric Telegraph.	Plant.	Rolling Stock.	Maintenance.	Establishment.	Contingencies.	Suspense Accounts.	
Punjab, Northern	£ 529,785	£ 1,719,099	£ 2,248,884	£ 26,510	£ 22,759	£ 1,027,938	£ 277,401	£ 67,723	£ 108	£ 112,062	£ 59,092	£ 3,696	£ 371,532	£ 14,014	£ 273,285	£ 7,146
Indus Valley	629,133	2,572,798	3,201,931	61,616	12,564	1,150,115	589,170	115,292	658	99,887	205,159	4,395	419,527	27,793	521,056	5,301
Hubli and Carwar	2,502	52,812	55,314	—	—	—	—	—	—	—	—	—	53,674	1,640	—	—
Wardha Valley, Coal	51,026	375,975	427,001	8,474	341	124,270	199,557	25,232	—	13,779	241	415	34,557	1,489	19,026	880
Holkar	305,630	871,119	1,176,749	3,251	4,617	526,333	208,921	68,404	—	32,041	114,864	266	121,522	8,987	91,412	3,369
Nemuch	269,962	398,987	668,949	20,972	424	123,191	186,681	27,961	—	14,872	6,345	969	89,510	5,699	193,243	778
Rajpootana	772,475	1,751,441	2,523,916	25,692	39,350	573,528	937,326	236,559	1,500	35,198	297,257	64	191,136	10,592	158,023	2,300
Western Rajpootana	—	52,313	52,313	4,269	—	—	—	—	—	1,994	—	—	43,258	2,260	557	25
Nulbaee	30,000	—	30,000	—	—	—	—	—	—	—	—	—	—	—	—	—
Calcutta and South-eastern	268,424	492,400	690,824	6,769	108,507	104,596	155,774	57,164	3,693	8,270	122,481	—	86,773	18,766	18,031	—
Northern Bengal	242,664	700,801	943,465	8,287	32,453	246,655	125,758	20,637	2,828	21,629	496	2,270	117,523	9,557	357,714	2,322
Seinda	42,769	115,576	158,336	1,911	1	40,746	1,295	3,329	—	4,879	41	5	29,914	967	75,519	771
Nagpur and Chuteesghur	—	11,250	11,250	1,679	—	—	—	—	—	707	—	—	8,502	320	62	20
Tirhoot	145,169	200,214	345,383	760	1,448	69,311	168,705	11,098	—	16,851	28,365	—	30,007	1,756	17,363	281
Rangoon and Irrawaddy Valley	179,530	447,793	627,323	2,394	12,720	105,032	262,706	44,381	—	17,635	28,618	—	47,928	1,787	104,614	572
Rangoon and Sittang Valley	—	9,406	9,406	965	—	—	—	—	—	615	—	—	7,447	330	50	1
Moradabad, Deobund, and Roorkee	—	2,852	2,852	52	—	—	—	—	—	34	—	—	2,616	150	—	—
Kosi Extension	—	3,507	3,507	241	—	—	—	—	—	46	—	—	3,104	116	—	—
Assam Extension	—	4,246	4,246	309	—	—	—	—	—	178	—	—	3,536	135	94	6
Hathras and Muthra Section, Light	—	96,927	96,927	93	930	3,480	52,854	12,194	—	627	14,020	—	7,000	175	5,504	10
Provincial Railway.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hathras and Kasganj, ditto, ditto	—	61	61	61	—	—	—	—	—	—	—	—	—	—	—	—
Cawnpore and Furruckabad, ditto, ditto	—	1,061	1,061	1,061	—	—	—	—	—	—	—	—	—	—	—	—
NATIVE STATES.																
Nizam's	145,217	1,010,746	1,155,963	1,057	—	401,121	471,329	108,014	—	16,260	9,163	—	112,792	4,848	35,446	4,067
Khamgaum Branch	—	48,530	48,530	37	39	10,921	29,323	4,638	125	343	32	—	2,838	234	—	—
Omrootee Branch	13,316	30,418	43,734	112	245	9,418	25,259	4,344	110	302	15	—	3,806	123	—	—
Mysore	—	11,624	11,624	550	—	—	—	—	—	831	—	—	9,994	249	—	—
Total	3,627,593	10,911,956	14,539,549	177,122	236,258	4,546,635	3,712,059	806,870	9,022	398,980	885,659	12,080	1,798,496	111,987	1,870,999	26,663

* This amount was paid to the Oude and Rohilkund Railway Company for purchase of the Line.

Note.—The total expenditure in England on State Railways to 31st October 1876 amounted to 4,090,841*l*. The above figures represent only that portion of such expenditure which had been appropriated in India to the several undertakings to the date of the last advices received.

India Office, 30th June 1877.

T. W. KEITH,
Accountant.

STATEMENT No. 2.

Showing the AMOUNT of CAPITAL authorized to be raised for each Undertaking as now sanctioned, the Amount raised, and the Amount withdrawn, to 31st March 1877.

Railway.	Amount authorized to be raised on 31st March 1877.					Amount raised in England to 31st March 1877.					Amount raised in India to Date of last Advances.		Total Amount withdrawn to 31st March 1877 (partly estimated).
	Share Capital.	Debentures.	Debenture Stock.	Capital not bearing Interest.	Total.	Share Capital.	Debentures.	Debenture Stock.		Capital not bearing Interest.	Share Capital.	Capital bearing Interest.	
								Stock repaid.	Cash received.				
East Indian—Main Line	£ 22,992,960	£ 2,719,850	£ 1,500,000	£ 170,488	£ 27,383,298	£ 22,615,804	£ 2,719,850	£ 1,500,000	£ 169,150	£ 326,325	£ 1,338	£ 27,332,467	£ 27,308,206
” Jubbulpore Line	£ 3,200,000	—	—	£ 43,249	£ 3,243,249	£ 3,189,350	—	—	£ 43,249	£ 7,665	—	£ 3,240,264	£ 3,400,485
Great Indian Peninsula	£ 20,000,000	£ 268,800	£ 3,065,300	£ 229,602	£ 23,563,702	£ 19,424,815	£ 268,800	£ 2,704,450	£ 228,860	£ 495,563	£ 742	£ 22,894,339	£ 22,798,608
Madras	£ 10,264,100	—	—	£ 9,898	£ 10,273,998	£ 10,247,671	—	—	£ 9,898	—	—	£ 10,257,569	£ 10,103,795
Bombay, Baroda, and Central India	£ 7,550,300	£ 200,000	—	£ 35,387	£ 7,785,687	£ 7,528,628	£ 200,000	—	£ 35,387	£ 21,672	—	£ 7,785,887	£ 7,846,380
Scinde, Punjab, and Delhi	£ 11,418,900	—	—	£ 4,403	£ 11,423,303	£ 10,988,984	—	—	£ 4,336	£ 86,253	£ 67	£ 11,079,640	£ 10,561,045
Eastern Bengal	£ 2,255,520	£ 462,350	£ 411,308	£ 2,288	£ 3,131,466	£ 2,238,996	£ 462,350	£ 411,308	£ 2,288	£ 16,486	—	£ 3,094,850	£ 3,093,969
Oude and Rohilkund	£ 4,000,000	£ 1,115,300	£ 384,700	£ 3,352	£ 5,503,352	£ 3,575,581	£ 1,115,300	£ 384,700	£ 3,352	£ 424,419	—	£ 5,473,241	£ 5,493,595
South Indian	£ 3,213,559	£ 400,000	£ 425,000	£ 63,596	£ 4,102,155	£ 3,184,688	—	£ 425,000	£ 63,541	£ 1,221	£ 55	£ 3,674,505	£ 3,766,182
Total	£ 84,865,339	£ 5,166,300	£ 5,786,308	£ 562,263	£ 96,410,210	£ 82,994,517	£ 4,766,300	£ 5,422,453	£ 5,129,878	£ 1,379,604	£ 2,202	£ 94,832,562	£ 94,272,265

India Office, 12th April 1877.

T. W. KRITH,
Accountant.

STATEMENT No. 3.

SHOWING the AMOUNT received from and withdrawn by each Company during the Year ended 31st March 1877.

Railway.	Sums standing to the Credit of the Companies on the 31st March 1876.	Sums advanced to the Companies on the 31st March 1876.	Amount received						Amount withdrawn				Total received during the Year ended 31st March 1877.	Total withdrawn during the Year ended 31st March 1877.	
			In England, between 1st April 1876 and 31st March 1877.			In India, between 1st April 1876 and the Date to which Accounts have been received.			On account of Stores, Establishment Charges, &c.	For Discharge of Debentures.	Date to which Accounts have been received.	Amount.			Estimated Withdrawals between Dates specified and 31st March 1877.
			Share Capital.	Deben-tures.	Deben-ture Stock.	Capital not bearing Interest.	Share Capital.	Capital not bearing Interest.							
East Indian, Main Line.	£ 190,869	£ —	£ 47,755	£ —	£ —	£ 7,061	£ —	£ —	£ 262,695	£ 54,720	31st December 1876	£ 85,991*	£ 110,000†	£ 121,424	
East Indian, Jubbulpore Line.	—	173,586	—	—	—	—	—	—	—	—	"	8,365*	5,000†	43,365	
Great Indian Peninsula.	688,160	—	360,690	—	—	—	90,516	—	373,326	1,035,450	"	100,644*	265,000†	1,043,635	
Madras	221,899	—	3,170	—	—	—	—	—	101,084	38,300	"	8,089*	60,000†	71,295	
Bombay, Baroda, and Central India.	104,361	—	—	—	—	—	—	—	91,819	45,300	"	37,935	10,000†	165,054	
Scinde, Punjab, and Delhi.	564,683	—	—	—	—	—	—	—	69,660	—	31st October 1876	6,428	30,000†	46,088	
Eastern Bengal	—	392,963	—	—	—	—	—	—	14,919	27,100	31st December 1876	13,937	43,000†	42,956	
Oude and Rohilkund	185,060	—	—	—	—	—	—	—	157,133	—	"	38,281	10,000	205,414	
South Indian	291,357	—	15,000	—	—	—	—	—	151,706	—	"	206,328	40,000	398,034	
Total	2,246,389	566,549	426,615	436,800	—	7,061	90,516	—	1,222,842	1,200,870	—	99,823	443,000†	2,080,535	

* Transfers of expenditure to Revenue Account, Sale proceeds of Stores, Refunds, &c., exceed by these sums the amounts withdrawn in India on Capital Account during the year.

† It is estimated that, on receipt of advices from India regarding transfers, which are several months in arrear of advices of cash transactions, transfers of expenditure to Revenue Account, &c., will have exceeded withdrawals to this extent.

India Office, 12th April 1877.

T. W. KEITH,
Accountant.

STATEMENT of WITHDRAWALS out of CAPITAL for EXPENDITURE; showing the Amount withdrawn] in England and in India by all the Guaranteed Indian Railway Companies during each Financial Year from the commencement to 31st March 1877.

Year.	England.	India.	Total.
	£	£	£
1849-50	69,211	6,682	75,893
1850-51	61,164	38,099	99,263
1851-52	154,212	197,111	351,323
1852-53	174,920	252,640	427,560
1853-54	252,484	418,165	670,649
1854-55	960,878	769,278	1,730,156
1855-56	1,935,074	1,431,337	3,366,411
1856-57	1,752,813	1,762,287	3,515,100
1857-58	1,328,243	2,094,825	3,423,068
1858-59	1,941,033	3,551,075	5,492,108
1859-60	2,508,668	4,662,796	7,171,464
1860-61	2,388,315	5,190,400	7,578,715
1861-62	1,597,430	5,004,782	6,602,212
1862-63	1,852,393	4,010,951	5,863,344
1863-64	1,415,146	3,340,507	4,755,653
1864-65	1,396,821	2,725,419	4,122,240
1865-66	2,222,679	3,414,187	5,636,866
1866-67	3,958,357	3,339,346	7,297,703
1867-68	3,924,490	3,195,591	7,120,081
1868-69	1,969,814	2,512,084	4,481,898
1869-70	2,298,680	2,444,171	4,742,851
1870-71	1,899,054	1,877,216	3,776,270
1871-72	886,996	1,609,732	2,496,728
1872-73	822,995	345,750†	477,245
1873-74	1,028,032	334,979†	693,053
1874-75	1,174,893	86,982†	1,087,911
1875-76	1,151,585	200,779†	950,806
1876-77	1,222,842	343,177*†	879,665*
Deduct amount withdrawn by the Calcutta and South-eastern Railway Company, this Railway having subsequently become the property of the State	42,349,222	52,537,014	94,886,236
	267,362	346,609	613,971
	42,081,860	52,190,405	94,272,265

* These amounts are partly estimated.

† Transfers of expenditure to Revenue Account, Sale proceeds of Stores, Refunds, &c., exceed by these sums the amount withdrawn in India on Capital Account.

Note.—The total expenditure in India in each year as shown in the above Statement will not be found to coincide with that shown in the Indian Finance and Revenue Accounts, owing to the fact that the transfers of expenditure to Revenue Account can only be made in the books in this country on receipt of advices from India, and are consequently brought to account some months later than in the Indian books.

India Office,
12th April 1877.

T. W. KEITH,
Accountant.

STATE OF DEBENTURE LOANS on the 31st March 1877.

Railway.				Amount.		Rate of Interest	Date at which Loan expires.
				£	£		
East Indian	-	-	-	96,400		4½	10th August 1877.
"	-	-	-	183,450		4½	" " "
"	-	-	-	1,000,000		4½	22d August 1877.
"	-	-	-	440,000		4	19th March 1878.
"	-	-	-	1,000,000		4½	1st January 1881.
					2,719,850		
Great Indian Peninsula	-	-	-	268,800		4	30th June 1878.
					268,800		
Bombay, Baroda, and Central India	-	-	-	200,000		4	1st January 1882.
					200,000		
Eastern Bengal	-	-	-	52,650		4	1st November 1884.
"	-	-	-	409,700		4	12th July 1886.
					462,350		
Oude and Rohilkund	-	-	-	615,300		4	4th June 1880.
"	"	-	-	500,000		4	1st August 1881.
					1,115,300		
					4,766,300		

Note.—None of the above Debentures are convertible into Share Capital.

India Office,
12th April 1877.

T. W. KEITH,
Accountant.

REVENUE.

57. The net revenue derived from the railways during the year 1876 was 4,564,823*l.*, compared with 3,647,868*l.* of the previous year. The State lines, 935 miles in length, earned 113,401*l.*, and the guaranteed lines, 6,000 miles in extent, earned 4,451,422*l.* According to the account given below, the guaranteed interest advanced during the year 1876 amounted to 4,634,222*l.*, so that there was a difference only of 182,800*l.* between that and the receipts. But inasmuch as certain lines earned surplus profits to the amount of 833,170*l.*, half that sum (after deducting 19,835*l.*, contributed to the Provident Fund of the East Indian Railway) had to be returned to the Companies. In the previous year the difference between receipts and guaranteed interest was 1,073,882*l.*, and the half surplus profits amounted to 173,506*l.* The net amounts chargeable against the revenues of the country for the two years respectively were, in 1875, 1,247,338*l.*, in 1876, 588,467*l.* This is a great improvement, and full of encouragement for the future. During the past year the famine in Southern India caused a large movement of grain from the north-west, which added considerably to the traffic of the East Indian, the Great Indian Peninsula, and the Madras lines, but irrespective of this explanation of part of the increase, there has been a large demand for wheat and seeds for exportation, and the cultivation of land for the purpose of meeting the demand is annually extending. These and other signs of a steady advance, not only in the traffic, but in a prudent and economical management of the railways, enabled Sir John Strachey, in his budget statement on the 15th March, to observe that he regarded "the progress of the railways" as one of the most hopeful and important facts connected with the future of "our finances." The returns relating to the traffic of the present year, which have already been received, justify the expectation that the guaranteed interest advanced by the Government will be covered by the net receipts, even after deducting the share of surplus profits due to the Companies.

58. A difference will be observed between the amount given above and that stated in the Annual Revenue (Home) Accounts, as the deficit payable out of the revenues of India for the guaranteed interest. This is explained by the difference in the time which makes up the year in each case. The *official* year ends with the 31st March, the *railway* year on the 31st December. The railway accounts are made up each half year ending the 30th June and the 31st December, and the guaranteed interest is also due on those days. From these last accounts the results above given are derived.

59. The gross receipts of the guaranteed lines, for the year, were 8,369,883*l.*, compared with 7,113,898*l.* of the previous year. The expenses were 3,976,296*l.*, compared with 3,537,484*l.*, being 47 per cent., as against 49 per cent. of the receipts.

Gross
receipts,
Guaranteed
railways.

60. The gross receipts of the State lines amounted to 424,099*l.*, as compared with 298,181*l.*, and the expenses to 310,695*l.*, compared with 226,827*l.*, being 73 per cent. as against 76 per cent. Gross receipts, State lines.

61. The gross receipts from both together were thus 8,793,982*l.* and the working expenses 4,229,156, leaving, as before stated, a net revenue of 4,564,828*l.*

62. The line which has contributed most to these satisfactory results is the East Indian, but others are approaching its position of prosperity and there is ground for hoping that before very long the earnings of most, if not of all, the guaranteed lines will cover the guaranteed interest. East Indian.

63. Taking the capital expended upon these undertakings up to the end of the year at 94,270,000*l.*, the average receipts per cent. per annum would be 4*l.* 14*s.* 5*d.* Average receipts per cent. per annum.

64. Of the above amount,—

Per Cent. per Annum.

	£	s.	d.
27,208,200 <i>l.</i> , representing the main line of the East Indian, earned	7	6	0
or			
30,608,600 <i>l.</i> , including the Jubbulpore line, earned	6	9	0
22,800,000 <i>l.</i> , representing the Great Indian Peninsula, earned	5	3	0
3,094,000 <i>l.</i> , „ „ Eastern Bengal	5	16	0
7,847,000 <i>l.</i> , „ „ Bombay, Baroda, and Central Indian*	3	11	0
5,450,000 <i>l.</i> , representing the Oude and Rohilkund, earned	2	9	0
3,766,100 <i>l.</i> , „ „ South Indian†	2	7	0
10,104,000 <i>l.</i> , „ „ Madras	2	6	0
10,560,000 <i>l.</i> , „ „ Scinde, Punjab, and Delhi‡	2	5	0

65. Surplus profits were earned to the amount of 833,170*l.* viz. :— £

By the East Indian (in both half years)	651,664
The Great Indian Peninsula (in the first half year)	125,816
The Bombay, Baroda, and Central India (in the first half year)	20,343
The Eastern Bengal (in the second half year)	35,347

Surplus profit.

Half of these amounts was retained by the Government.

66. I may here mention that the financial results of some of the recent branches of the Bombay and Baroda Railway have been very satisfactory, the receipts having more than covered the guaranteed interest on the capital. Mr. Wood, the Auditor of that Company in India, after analyzing the figures of the separate accounts of the Main line and branches of that railway, shows that the Main line to Sabarmuttee earned 3·68 per cent., the Wudwan extension earned 5·14, and the Dakor branch 6·23 per cent. per annum, aptly observing that, “while this comparison shows that low first cost is essential to the financial success of branch lines in this country, the results realized in the case of our own lateral extensions prove that carefully selected and economically constructed branch lines, in good agricultural districts, not only stimulate the trading and productive energies of the people, who are, by their introduction, placed in easier communication with larger markets and centres of commerce, but that, with good management, they may directly benefit the State and the proprietors of the main undertaking.”

Branch lines of Bombay and Baroda Railway.

67. The Revenue Statement, giving the particulars of the receipts and expenses of each railway for the year, will be found on pp. 24, 25. This statement gives the actual amount of revenue yielded by the railways, after all adjustments have been made with the concurrence of Government. If the results differ from those in the Traffic Statements (from p. 38 to p. 43), it is because there may be some claim which, outstanding perhaps from former years, had to be settled. In the case of the Great Indian Peninsula Railway, for instance, the expenditure from the half year's revenue was reduced by contributions to the extent of 88,884*l.* from funds raised from the receipts of previous years, and in the case of the Eastern Bengal, the earnings, 31,000*l.*, from the *steamers* used by the Company are not included in the *railway* returns.

Statements and Tables.

* The earnings of the Bombay, Baroda, and Central India Railway would also have been larger, but for an outlay of *l.* from Revenue for repairs to the Nerbudda Bridge.

† With regard to the South Indian, it should be remarked that a great portion of the line has only just been opened, and also that a loss of 18,441*l.* was incurred, and charged to Revenue, by the sale of broad gauge rolling stock, which they no longer required, on account of the adoption of the metre gauge for their line.

‡ The earnings of this line would have been better by 26,000*l.*, but for the exceptional charges to revenue, on account of the expenditure on the bridges for protective works.

STATEMENT showing the REVENUE from the INDIAN RAILWAYS in 1875 and 1876, as given in the Accounts passed by Government.

Railway.	Receipts.				Expenditure.			Percentage of Expenditure to Gross Receipts.	Net Receipts.
	Passengers.	Goods.	Miscellaneous.	Total.	Maintenance.	Working, &c.	Total.		
	£	£	£	£	£	£	£		£
GUARANTEED.									
East Indian, Main Line] - { 1876 1875	851,089 804,344	2,058,301 4,622,681	100,794 85,671	3,010,184 2,509,663	286,553 226,435	738,383 736,619	1,024,936 963,054	34 38	1,985,248 1,546,609
" Jabalpur Line - { 1876 1875	91,613 77,300	128,334 92,498	25,222 15,550	245,169 185,048	39,772 38,654	80,266 68,672	120,038 107,326	49 58	125,131 77,722
Great Indian Peninsula - { 1876 1875	483,374 478,530	1,686,786 4,457,666	66,020 36,888	2,236,171 4,973,084	167,855 158,742	889,710 774,044	*1,057,565 932,786	47 47	1,178,606 1,040,298
Madras - - - { 1876 1875	237,370 226,049	393,904 344,523	20,821 18,820	652,095 589,392	125,959 152,016	293,854 262,188	419,813 444,204	64 70	232,282 175,188
Bombay, Baroda, and Central India - - - { 1876 1875	214,530 228,348	386,610 343,382	19,654 13,724	620,794 585,454	114,813 81,378	230,329 237,165	340,227 318,543	55 54	280,567 266,911
Sind, Punjab, and Delhi - { 1876 1875	225,745 224,458	342,012 269,824	163,124 20,653	730,881 511,935	131,325 79,060	361,966 248,996	493,291 328,056	67 64	237,590 183,979
South Indian - - - { 1876 1875	113,402 54,228	68,821 44,393	8,562 4,732	190,785 103,353	7,111 7,698	94,522 42,076	101,633 49,774	53 48	89,152 53,579
Eastern Bengal - - - { 1876 1875	108,542 110,298	181,067 146,472	44,053 39,048	333,662 295,818	32,437 54,657	121,714 135,424	154,151 190,084	46 64	179,511 105,787
Oude and Rohilkhand - - { 1876 1875	156,851 137,585	164,091 130,602	20,199 6,985	341,142 275,122	41,255 33,015	165,552 131,258	206,807 164,273	49 59	134,335 110,849
Totals for Guaranteed Railways { 1876 1875	2,482,516 2,340,994	5,409,926 4,530,266	468,449 242,638	8,369,883 7,113,898	847,080 845,054	2,976,296 2,692,430	3,918,461 3,537,484	47 49	4,451,422 3,576,514

* Exclusive of 90,207l. charged to Special Funds.

Railway.	Receipts.			Expenditure.			Per-centage of Expenditure to Gross Receipts.	Net Receipts.
	Passengers.	Goods.	Miscellaneous.	Total.	Maintenance.	Working, &c.	Total.	
	£	£	£	£	£	£	£	£
STATE LINES.								
Calcutta and South-eastern - { 1876 1875	6,937 6,324	*2,715 2,854	182 4,157	9,834 10,365	3,352 2,014	7,331 6,329	10,683 8,343	Loss 849 2,022
Nalhati - - - { 1876 1875	4,790 5,324	*2,603 2,566	126 52	7,519 7,942	3,770 4,811	4,488 4,327	8,358 6,138	Loss 839 4,804
Rajputana - - - { 1876 1875	84,107 61,730	148,301 108,378	4,150 4,620	236,558 174,728	43,004 33,480	109,316 78,066	152,320 111,246	84,238 63,482
Wardha Valley - { six months 1876 - - - 1875	319 395	1,587 2,240	8 39	1,914 2,674	568 697	1,707 2,170	2,275 2,867	Loss 361 Loss 193
Holkar's - - - { 1876 1875	10,809 7,829	23,463 23,313	3,567 603	37,839 31,945	5,910 3,234	29,355 27,352	35,265 30,586	2,574 4,359
Nizam's - - - { 1876 1875	23,217 25,136	29,979 20,204	128 174	53,324 45,514	12,669 16,132	33,042 35,709	45,711 51,841	7,612 Loss 6,327
Punjab, Northern - { 1876 1875	25,662 9,704	21,336 4,364	585 208	47,583 14,276	11,583 4,992	24,106 6,066	35,689 8,058	11,894 6,218
Tirhut - - - { 1876 1875	5,115 686	6,917 783	†5,910 9	17,942 4,478	2,883 506	9,437 581	12,320 4,087	5,622 391
Berar - { Amraoti - - - { 1876 1875	712 740	5,601 4,070	57 16	6,370 5,426	283 320	4,196 3,808	4,479 4,128	1,890 1,298
Neemuch - - - { six months 1876 - - - 1875	135 151	2,310 3,671	14 11	2,959 3,833	254 280	1,888 2,253	2,142 2,533	816 4,300
Totals for State Railways - { 1876 1875	164,054 118,049	245,312 173,243	14,783 6,889	424,099 298,181	84,276 60,166	224,966 166,661	310,695 226,827	113,401 71,354
Grand Total for all Railways - { 1876 1875	2,646,570 2,459,043	5,655,238 4,703,509	483,232 249,527	8,793,982 7,412,079	931,355 905,220	3,201,262 2,859,991	4,229,156 3,764,311	4,564,823 3,647,868

* Includes goods miscellaneous earnings.

† Includes 5,522½ receipts from construction on account of hire of locomotives and vehicles.

GUARANTEED INTEREST.

68. The following tables relate to the advances made by Government on account of the guaranteed interest. It will be seen that a sum of 4,634,222*l.* was paid during the year ending the 31st December last, and that up to that date the total amount advanced was 61,558,745*l.* By the table which follows, it will be observed that of this 61,558,745*l.*, 34,724,213*l.* had been recovered from the Companies, leaving 26,834,532*l.*, with simple interest at 5 per cent. per annum, to be paid back out of the half surplus profits of the future.

69. It will also be seen that, although up to the 30th June 1876 a sum of 23,191,094*l.* has been paid from time to time to the East Indian Railway on account of guaranteed interest, the aggregate net receipts from that time have reduced the amount to 5,258,456*l.*, while out of 14,724,534*l.* paid to the Great Indian Peninsula, 6,480,493*l.* remains as the net amount advanced, and out of 6,376,669*l.* paid to the Scinde, Punjab, and Delhi, a sum of 5,256,237*l.* remains.

70. The amount which has been contributed by the surplus profits towards the discharge of the guaranteed interest is 1,491,969*l.*, being half the sum of 3,030,167*l.*, less 46,229*l.* paid out of the surplus profits of the East Indian Railway to the Provident Fund, which represents the whole amount realized up to 31st December last by the excess profits over and above the guaranteed interest. Of this latter sum, 4,273,573*l.* was contributed by the East Indian.

GUARANTEED INTEREST.—INDIAN RAILWAYS.

STATEMENT of the Total Amount of INTEREST advanced to each of the under-mentioned Railway Companies to the 31st December 1876.

Railway Company.	Interest advanced to 31st December 1875.	Interest advanced during 1876.						Total.
		England.		India.		Total.		
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	
East Indian, Main Line	19,848,686 7 5	1,298,131 17 3	9,330 3 2	1,307 0 5	21,156,148 7 10			
" Jubbulpore Line - - -	1,875,094 15 9	159,467 10 0	383 5 0	159,850 15 0	2,034,945 10 9			
Great Indian Peninsula	13,580,493 5 4	1,134,383 1 0	9,658 1 0	1,144,041 2 0	14,724,534 7 4			
Madras - - - -	6,879,575 18 2	512,480 13 11	—	512,480 13 11	7,392,056 12 1			
Bombay, Baroda, and Central India - -	4,694,686 9 1	387,559 19 0	217 16 3	387,777 15 3	5,082,464 4 4			
Scinde, Punjab, & Delhi	5,822,871 0 0	551,298 10 0	2,499 6 5	553,797 16 5	6,376,668 16 5			
Eastern Bengal - -	1,608,544 8 5	130,830 3 4	919 14 9	131,749 18 1	1,740,294 6 6			
Oude and Rohilkund -	1,255,088 0 9	256,805 15 0	3,194 5 0	260,000 0 0	1,515,088 0 9			
South Indian - -	1,359,482 3 3	177,062 9 6	—	177,062 9 6	1,536,544 12 9			
Total - - -	£ 56,924,522 8 2	4,608,019 19 0	26,202 11 7	4,634,222 10 7	61,558,744 18 9			

India Office, 12th April 1877.

T. W. KEITH, Accountant.

A STATEMENT showing approximately the Amounts advanced on account of **GUARANTEED INTEREST** to the several under-mentioned Railway Companies to the 30th June 1876, beyond the amount of Net Revenue applied thereto.

Railway Company.	Total Amount advanced to 31st December 1876.*	Aggregate of Net Revenue Balances for the several half-years to 30th June 1876, inclusive.	Net Amount advanced.
	£	£	£
East Indian, Main Line - -	21,156,148	17,390,025	3,766,123
„ Jubbulpore Line - -	2,034,946	542,613	1,492,333
Great Indian Peninsula - -	14,724,534	8,244,041	6,483,493
Madras - -	7,392,057	3,190,984	4,201,073
Bombay, Baroda, and Central India - -	5,082,464	2,284,957	2,797,507
Scinde, Punjab, and Delhi - -	6,376,669	1,120,432	5,256,237
Eastern Bengal - -	1,740,294	1,205,535	534,759
Oude and Rohilkund - -	1,515,088	279,943	1,235,145
South Indian - -	1,536,545	465,683	1,070,862
Total - -	£ 61,558,745	34,724,213	26,834,532

* The Interest for the half-year to 30th June 1876 not being paid until the succeeding half-year.

India Office, 12th April 1877.

T. W. KEITH, Accountant.

STATEMENT showing the Amount of **SURPLUS PROFITS** earned by Guaranteed Railways to 31st December 1876 inclusive.

Company.	To end of 1872.	Half year to 30th June 1873.	Half year to 31st Dec. 1873.	Half year to 30th June 1874.	Half year to 31st Dec. 1874.	Half year to 30th June 1875.	Half year to 31st Dec. 1875.	Half year to 30th June 1876.	Half year to 30th Dec. 1876.	Total.
	£	£	£	£	£	£	£	£	£	£
East Indian Railway, Main Line	741,008	167,753	104,688	641,832	77,951	158,539	38,702	352,531	299,133	2,582,137
„ Jubbulpore Line	—	—	—	11,238	—	—	—	—	—	11,238
Great Indian Peninsula Railway	69,555	—	—	—	—	143,838	—	125,816	—	339,209
Bombay, Baroda, and Central India	5,864	—	—	4,723	—	5,934	—	20,343	—	36,864
Eastern Bengal -	—	—	8,411	7,810	9,151	—	—	—	35,347	60,719
Total -	816,427	167,753	113,099	665,603	87,102	308,311	38,702	498,690	334,480	3,030,167

T. W. KEITH, Accountant.

India Office, 13th June 1877.

71. The low rate of exchange for bills on India which has lately prevailed has drawn more particular attention to the losses which are incurred by Government, in consequence of the fixed rates in the contracts with the several Companies for transactions in this country. It will be seen by the subjoined statements that the Government has sometimes, and for some transactions, lost, and at others gained. On the whole they have lost considerably, for it unfortunately happened that when the advances in sterling for the supply of materials for construction purposes were large, the rate of exchange was high, and when the receipts of the railways in rupees were large, and had to be converted into sterling, the rate of exchange became low. The rate which was fixed in the contracts with the principal Companies was 1s. 10d.; but in one instance it is 1s. 11d., and in another 2s. the rupee. The net loss up to the end of the year 1875-76 was 1,454,867l.

STATEMENT showing the Loss or Gain to India in each Year, by adopting in the Transactions with the Guaranteed Railway Companies the rates of Exchange specified in the several Contracts, as compared with the average rate obtained in each Year for Bills of Exchange drawn on India.

Year.	Average Rate for Bills on India.	Loss by Exchange in adopting the Rate of 1s. 10d. the Rupee.	Gain by Exchange in adopting the Rate of 1s. 10d. the Rupee.	Gain by Exchange in adopting the Rate of 1s. 11d. the Rupee.*	Gain by Exchange in adopting the Rate of 2s. the Rupee.†	Loss by Exchange in adopting the Rate of 2s. the Rupee.
	s. d.	£	£	£	£	£
1849-50	1 10 ¹ / ₂	—	195	—	—	—
1850-51	2 0 ¹ / ₄	—	4,076	—	—	—
1851-52	2 0 ³ / ₈	13,909	—	—	—	—
1852-53	1 11 ⁷ / ₈	20,456	—	—	—	—
1853-54	2 0 ¹ / ₈	39,485	—	—	—	—
1854-55	1 11 ¹ / ₈	33,663	—	—	—	—
1855-56	2 0 ¹ / ₈	118,734	—	—	—	—
1856-57	2 1 ¹ / ₄	230,251	—	—	—	—
1857-58	2 0 ³ / ₈	232,656	—	—	—	—
1858-59	+	—	—	—	—	—
1859-60	+	—	—	—	—	—
1860-61	+	—	—	—	—	—
1861-62	1 11 ⁷ / ₈	393,865	—	—	—	—
1862-63	1 11 ⁷ / ₈	297,923	—	—	—	—
1863-64	1 11 ⁷ / ₈	226,489	—	—	—	—
1864-65	1 11 ⁷ / ₈	136,920	—	—	—	—
1865-66	1 11 ³ / ₄	44,193	—	—	—	—
1866-67	1 11	55,840	—	—	—	—
1867-68	1 11 ¹ / ₈	57,305	—	—	674	—
1868-69	1 11 ¹ / ₈	11,669	—	—	2,647	—
1869-70	1 11 ¹ / ₄	—	25,019	—	6,878	—
1870-71	1 10 ¹ / ₂	—	32,966	—	21,252	—
1871-72	1 11 ³ / ₈	—	144,151	—	14,499	—
1872-73	1 10 ³ / ₈	—	-107,492	—	31,771	—
1873-74	1 10 ³ / ₈	—	62,529	—	26,284	—
1874-75	1 10 ¹ / ₈	—	21,777	5,537	10,149	—
1875-76	1 9 ³ / ₈	68,596	—	10,161	—	970
Total -	—	1,981,954	398,205	15,698	114,154	970

* Adopted in the case of the South Indian Railway Company, which was formed in the year 1874-75 by the amalgamation of the Great Southern of India and Carnatic Railway Companies.

† Adopted in the case of the Oude and Rohilkund Railway Company, and until 1873-74 inclusive, in that of the Carnatic Railway Company.

‡ Up to the year 1860-61 inclusive the Home Treasury was open at all times for the sale of bills on India, at rates altered from time to time by advertisement. Consequent on the mutiny it was necessary to refrain from drawing on India, and the exchange was raised to a prohibitory rate.

THOS. W. KEITH, Accountant.

India Office, 22nd June 1877.

TRAFFIC.

72. There has been considerable improvement in the traffic during the year, and although some of it is due to the movement of grain from the North-West Provinces to the famine stricken districts of Southern India, there are clear indications that a growth of a healthy kind has commenced, and is likely to continue. The increase has taken place principally in the staple commodities of the country, such as seeds, grain, salt, coal, sugar, and jute. Cotton is almost the only article that has not been carried to the same extent as in the previous year. The most remarkable feature in the traffic returns is the large increase under the heads of grain and seeds. Five years ago, the quantities of these articles carried on all the railways then open were 7,460,340 cwt. and 2,672,640 cwt. respectively, or 10,132,980 cwt. together; last year the amounts were 25,640,720 cwt. and 11,862,260 cwt., or a total of 37,502,980 cwt.

73. It is hardly necessary to observe that these figures represent the aggregate amount of the traffic on all the railways put together, and not the quantity carried over each mile of railway. But the stimulus which has been given to the grain and seed trade between India and this country may be seen in the fact that, while in the twelve months ending with March 1871 the wheat exported from India to the United Kingdom was 248,522 cwt., and the oil seeds 1,384,023 cwt., in the twelve months ending last March the exports of wheat to this country were 4,337,208 cwt., and of oil seeds 3,740,362 cwt. The exports of wheat from

Traffic in grain and seeds.

Calcutta alone during the year were 3,404,800 cwt., of which more than half was brought down by the railway.

74. Another important feature, as showing how the wants of the mass of the people may be met by means of railways, is the increase in the salt traffic. In 1871, the amount of salt carried by the railways was 225,572 tons; in 1876 it was 536,837 tons.

75. Largely as the traffic has increased, it might have been still greater if more rolling stock had been available. The want of locomotives and wagons has been a great check, and I am afraid that goods have, in consequence, sometimes, been damaged by delay and exposure. The Agent of the Oudh and Rohilkund Railway recently observed that three times the amount of traffic might have been taken on that line if they had possessed the means of carrying it. On other lines it has been more or less the same. The stations in the Punjab and Delhi, and on the East Indian and Great Indian Peninsula, have frequently been blocked with grain and other goods, because the means of carrying them away failed. At Patna and Benares a steamboat service came to the aid of the East Indian Railway, and took some of the grain to the Kooshtea station of the Eastern Bengal Railway, and to Calcutta.

76. Of the State lines, the Rajpootana is at present the most important, but the Punjab Northern promises well. Both are in their infancy. The net profits of the Rajpootana have improved from 58,862*l.* in 1875, to 84,238*l.* in 1876. The total amount of goods carried was much the same, viz., 162,000 tons, but the receipts increased by 40,000*l.* The passengers in 1875 numbered 998,853; last year they were 1,295,597, and yielded 84,000*l.*, as compared with 61,730*l.* It must be remembered that these results relate to the first whole year during which the line has been worked since its completion. It cannot but be regarded as satisfactory that it should have yielded nearly 3½ per cent. per annum on an outlay of 2,500,000*l.* The Punjab Northern, also, has done well for its first year, both in passengers and goods. The number of the former carried was 701,477, and the weight of the latter 100,960 tons; the receipts from each being 25,662*l.* and 21,336*l.* Rajpootana line.

77. Some of the smaller State lines, such as the Oomrawuttee, Kamgaum, and Patri, also the Nizam's, are worked by the guarantee Companies, under arrangements by which the Companies do not derive direct pecuniary gain, but receive the benefit of the traffic brought to their lines.

78. The general results of last year's working show that the gross weight of goods carried was (including 72,514 tons by the Indus Flotilla) 5,871,690 tons, and the amount received for the conveyance of the same was 5,783,978*l.* During the previous year these amounts were respectively 4,388,650 and 4,698,506*l.*, showing an increase of 1,483,040 tons in weight and 1,085,472*l.* in money. The East Indian main line alone exhibits an increase of 363,000 tons, or 35 per cent., and of 435,622*l.*, or 26·9 per cent., over the previous year; the expenditure being 61,880*l.* more. The Jubbulpore line, an increase of 74,480 tons and 36,000*l.* and 13,000*l.* in expenses. The Great Indian Peninsula shows also an increase of 233,300 in tonnage and 221,096*l.* in receipts, the expenditure being 125,000*l.* greater than in the year 1875. The gross earnings from the conveyance on the Bombay, Baroda, and Central India Railway of 50,461 tons in excess of the previous year were 25,519*l.* more. The Eastern Bengal yielded an addition of 35,000*l.*, the weight conveyed showing an increase of 60,000 tons. On the Madras also the goods exceeded those of the year 1875 by 200,000 tons, the receipts therefrom being 390,000*l.*, compared with 343,000*l.* General results for the year. East Indian. Great Indian Peninsula. Bombay, Baroda, and Central India Railway. Eastern Bengal. Madras.

79. The famine in Southern India, where the area affected by the want of rain extends over 54,000 square miles, with a population of 8,000,000, has produced a very large grain traffic on the lines immediately connected with those districts, as well as on the East Indian and even the Punjab and Delhi. The railways in Madras were the means of conveying 310,957 tons of grain up to the end of March. Of this 146,254 tons were sent from Madras, and 35,000 were despatched in March alone. The locomotive power and stock at the command of the railway authorities were unfortunately inadequate. They had to borrow from other lines, and to indent on England for more. Effects of famine on traffic.

80. I have no hesitation in saying that the recent development which has occurred in the merchandise traffic is due, in a great measure, to the more liberal scale of charges which has lately been adopted. Other causes, especially the famine, have contributed to produce this effect, but the chief one is the reduction in the Effects of lower rates.

rates for carriage. The policy of moderately low rates for the staples of the country may, I am glad to say, now be regarded as one which has been generally accepted by the Companies, and its encouraging results will probably lead to its further extension. The greater the traffic, the more the rates may, within moderation, be safely lowered; for by good management, with a large traffic, full train loads may be secured, and waste of carrying power will be avoided. The railway can then afford to carry at cheaper rates. Thus one reacts upon the other. Low rates produce traffic and a large traffic proportionately reduces working expenses and increases profits. The two leading Companies, the East Indian and the Great Indian Peninsula, have acknowledged in their reports to the shareholders the success of their policy in lowering rates. The East Indian say, "it is this reduction of rates which has conduced so much to the late "development of traffic." The Great Indian Peninsula also observe "that the "modifications of rates and charges which have been adopted are operating "beneficially in aiding the development of the traffic."* The Scinde, Punjab, and Delhi Directors likewise congratulate themselves on the effect of lower rates upon their traffic; and the Agent of the Oudh and Rohilkund Company, when alluding to the changes made in the tariff for goods, by which considerable relief was given to the customer, observes that the results obtained "seem to indicate "that the change was required and has been appreciated."

81. We have seen the effect of the judicious reduction of rates on the traffic of one important article of consumption and of exportation, viz., wheat. There is another worthy of notice. On the Eastern Bengal Railway the rate for the carriage of salt was reduced to the extent of from 25 to 33 per cent., according to the distance it was conveyed. The traffic during the year preceding the reduction amounted to 70,524 maunds. The traffic for one year under the new rates has been 422,976, or an increase of 600 per cent. Sir John Strachey has a strong belief that a very large proportion of the population of India do not obtain that full supply of salt which they would take if they could get it. The impediment to increased consumption is the price at which it can be obtained, and there can be no doubt that the charge for conveyance on most of that which is consumed has, on account of the distance which it has to be conveyed, more to do with the price than the cost of production and the duty. The above confirms the correctness of Sir John Strachey's opinion. On the Rajpootana State line, however, from which there is a branch to Sambhur Salt Lake, the salt rates are twice as high as on the East Indian, and $2\frac{1}{2}$ times higher than on the Oudh and Rohilkund.

82. There is one more example of the results of a liberal policy worth noticing. On the Oudh and Rohilkund line the classification of goods was revised, 255 items being transferred to classes where the charge was lower, and 107 items, consisting of valuable articles involving extra care and risk, to where the charge was increased. Terminal charges of two pies per maund were also abolished on all goods carried upwards of 60 miles, so that the public were benefited to a considerable extent in the aggregate. The result justified the changes. The amount of goods carried increased from 170,835 to 260,462 tons, and the gross receipts from Rs. 7,44,806 to Rs. 9,26,271.

Passengers.

83. The passenger traffic has not shown the same degree of development, or given the same indication of expansion as the goods. If it had not been for the visit of His Royal Highness the Prince of Wales in 1875-76, and for the Delhi assemblage, the preparations for which commenced towards the end of the year, the last two years would not have shown much increase per mile open. Trials have been made in one or two cases with reduced rates. The effect was to increase numbers, and, where sufficient time has passed to test the trial, to enhance receipts also, but not in the same proportion. Some disappointment has been expressed that the effect has not been more rapid, and a return to higher charges has been advocated as a remedy. I do not expect that a remedy would be found in this course, but rather the reverse. It is, of course, possible to go too low, but, taking into consideration the poverty of the people and the small value they attach to time, that point has not been reached by the two pies ($\frac{1}{4}d.$) per mile rate, which is the lowest charge made. The comparative stagnation which appears to exist shows that some further inducement is required to tempt the mass of the

* These modifications consisted chiefly in removing the special charges (which amounted to three times the usual rates) for carrying goods over the Ghat inclines, and for terminals. This was tantamount to a reduction of about 40,000*l.* in the year's charges on the public.

people to use the railway more. The time has passed for using the argument that Natives do not care for moving about with ease and speed when they have the means and opportunity of doing so.

84. The total number of tickets issued last year to all classes (exclusive of periodical ticket holders) was 30,535,319, for an average mileage open of 6,592 miles, being 4,632 per mile. In the previous year the numbers were 26,779,437 for 6,298 miles, or 4,252 per mile. The receipts were 2,193,509*l.* from passengers in 1876, and in 1875 they were 2,083,932*l.* The receipts per train mile were the same in each year, viz., 5·78*s.* By far the greater bulk of the passengers were the lower classes. On most lines there are four classes, the two lowest being distinguished either as third and fourth, or intermediate and third, the fares being 4½, 3, and sometimes 2 pies. Out of the 30,535,319 who travelled last year, 29,641,237, or 97 per cent., consisted of the lower classes, 685,015, or 2·24 per cent., of the second class, and 209,065, or ·76 per cent. of the first class. The number of holders of season tickets increased from 17,490 to 20,437.

85. The number of miles travelled by trains of all descriptions was 21,609,411, Train mile-
age. compared with 17,950,312 of the previous year. The passenger train mileage was 3,664,354, compared with 3,908,029; the goods, 10,004,054, compared with 7,161,259; the mineral, 258,309, compared with 210,074; and the mixed goods and passengers, 7,291,940, as against 6,333,465.

86. The ton mileage, *i.e.*, the number of tons carried one mile, was 1,298,219,081, Ton mileage. compared with 905,697,217 of 1875.

87. The expenses of working and maintaining the railways, excluding the Indus Expenditure. Flotilla, amounted to 4,226,966*l.*, compared with 3,739,923*l.* of 1875. While the expenses were increased by 487,043*l.*, the receipts were increased by 1,360,329*l.* The proportion per cent. of expenditure to gross receipts was 47, and in 1875 it was 50·64. On the East Indian it was only 34·05 for the Main line, but 48·96 for the Jubbulpore. On the Great Indian Peninsula it was 47; on the Madras, 64·38; on the Bombay and Baroda, 54·80; on the Scinde, Punjab, and Delhi, 67·35; on the South Indian, 53·37; on the Eastern Bengal, 46·55; on the Oudh and Rohilkund, 63·94; and on the Rajpootana, 64·39. The maintenance and renewals last year came to 1,031,358*l.*, compared with 801,833*l.* of the previous year. The locomotive expenses were 130,742*l.*, and the repairs and renewals of stock 103,819*l.* more than 1875, and the increase in the coaching and merchandise expenses only 6,053*l.* Considering the large addition to the traffic during the year, this is very creditable to the management. On some lines especially there was a marked improvement, and this is the more satisfactory as showing an honest and serious effort to secure an efficient administration and enlarged returns at a diminished cost. Although the East Indian Main line earned 500,000*l.* more than the previous year by the conveyance of passengers and goods, their expenses connected with "coaching and merchandise" was 1,752*l.* less. The departments in which increased expenditure took place were the "maintenance and renewal" and "repairs and renewals of carriages and waggons." The Great Indian Peninsula likewise exhibits an increase of 263,000*l.* in receipts, and a diminution of 10,000*l.* in expenses under "coaching and merchandise." It also shows a considerable improvement in the general cost of doing its work. While in 1875 it took ·662*d.* to carry a ton of goods one mile, it only required ·572*d.* to do the same last year. The East Indian still holds the foremost place as the most economically managed line, and shows that during the year it has made further advances in diminishing expenditure. In 1875 the average cost of carrying a ton of goods one mile was ·324*d.*, in 1876 it was only ·253*d.*, a result which I believe to be unexampled in the records of railway economics. That, in addition to good management, it has natural advantages, is apparent by the fact that, under the same direction, the Jubbulpore branch of 224 miles presents returns of a less favourable kind. The results on the East Indian Main line, as compared with other lines is, in great measure, explained by the high average of the train loads. While the Great Indian Peninsula carried 88 tons in each train, and the Madras 52, the East Indian carried 132·7. The Bombay and Baroda carried 117, but their expenses are high, the cost of carrying a ton one mile being ·575*d.*, or more than twice that of the East Indian. The same remark applies to the Eastern Bengal.

88. The statements at pp. 36 to 43 provide statistical data from which other deductions, besides those already given, may be drawn. The tables, which, as usual, have been prepared by Mr. Rendel, and are given below, contain many interesting and instructive particulars, and enable comparisons of a very useful

kind to be made between the usefulness and profitableness of the different lines.

Fuel. 89. Before leaving the subjects of traffic and working, I should mention that Native coal is becoming more generally used. The East Indian Railway alone carried coal to the amount of 520,262 tons, and received for doing so 245,295*l*. Five years ago these respective amounts were 295,852 and 124,781*l*. A large portion of the increase arises from the supplies for the railways in the North-West, Oudh, and the Punjab. The Wurrora collieries are supplying portions of the Great Indian Peninsula system with coal at Rs. 5 per ton. It is supposed that the whole of the requirements of the Nagpore branch will be met from this source. Coal is also obtained from the Mhopani mines at 9 rupees at the pit's mouth, and from the Bengal collieries delivered at Jubbulpore, at 19 rupees. The average cost of English coal delivered at Bombay last year was 33*s*. An attempt was made to introduce Bengal coal into the Madras Presidency, but the lowest offer to supply it at Madras was at the rate of Rs. 21 a ton; and, as English coal could be obtained at a price below this, viz., Rs. 18, it will be necessary to wait until some arrangement can be made by which the cost of bringing the coal by sea from Calcutta to Madras can be reduced.

Acid in certain wood fuel. 90. The scarcity of wood in Madras is becoming greater every year, and the importance of obtaining a supply of fuel at a moderate cost, therefore, increases. I may here mention that one inconvenient effect of the use of wood fuel has lately been detected, but it would appear to be confined to wood from a particular locality, as no complaints have been made except with that obtained in Scinde. It was found that, in the locomotives running on the railway, the copper fire-box plates rapidly wore out. Specimens of the corroded metal were sent over, as well as several samples of the babool wood which was used. These were carefully analyzed by Dr. Watson, of Manchester, who reported that the rapid destruction of the plates was due to the presence of chloride of sodium (common salt) as one of the mineral constituents of the wood, that effect being increased in proportion to the height of the temperature at which the plates were exposed to the action of the gases. Inquiry is now being made as to the character of the soil and atmosphere where the trees were grown, in order to ascertain whether the saline ingredient in the wood may be traced to these sources.

91. The following Memorandum, which has been prepared by Mr. T. R. Watt, of the Great Indian Peninsula Railway, is interesting, as illustrating not only the value of cheap coal, but the effect upon its consumption of high and low average train loads in working.

92. Taking the weight of each passenger at 1 cwt., and including revenue stores carried free, the following results are obtained as showing the relationship between the quantity and cost of coal consumed per ton of freight carried *for the year ended 30th June 1876* :—

	Great Indian Peninsula Railway.	East Indian Railway.	
		Main Line.	Jubbulpore Line.
(1) Consumption of coal, per ton carried -	Lbs. 160	Lbs. 121	Lbs. 114
(2) Tonnage carried, per ton of coal consumed -	Tons. 14	Tons. 18½	Tons. 19½
(3) Cost of coal consumed, per ton carried -	s. d. 2 5½	s. d. 0 4½	s. d. 1 2½
(4) Tonnage carried, per <i>l</i> . of coal	Tons. 8	Tons. 56	Tons. 16

Precautions against infection. 93. In connection with the comfort and safety of passengers while travelling on the railways, I may mention that, to guard against the spread of epidemic or contagious complaints, so likely to occur in India, and so commonly propagated through the assemblage of a large number of people at the stations and the crowds in the trains, orders have been issued with the view of organizing preventive measures. These chiefly consist of isolating those who may be found infected, and of supplying them with the necessary medical aid, and of using proper disinfectants.

Returns prepared by Mr. Rendel.

The Returns given below are drawn up on the same principle as those given in previous years.

The Punjab and Delhi line is omitted this year, the accounts for this line, separate from those of the Scinde, not being obtainable. But the Oude and Rohilkund is inserted for the first time.

(a) PASSENGER TRAFFIC.

	East Indian Railway.		Great Indian Peninsula.	Madras.	Bombay, Baroda, and Central India.	Eastern Bengal.	Oudh and Rohilkund.
	Main.	Jubbulpore.					
Average length open, miles	No. 1,280 £	No. 223½ £	No. 1,266½ £	No. 858 £	No. 412 aver. £	No. 158 £	No. 548 £
(1.) Receipts from passenger traffic.	851,099	91,613	483,374	237,370	214,530	108,541	156,851
(2.) Passenger train miles run	No. 2,355,153 s. d.	No. 249,323 s. d.	No. 1,514,615 s. d.	No. 731,976 s. d.	No. 538,207 s. d.	No. 240,275 s. d.	No. 430,258 s. d.
(3.) Average passenger train mile receipts.	7 2½	7 4	6 4½	6 5½	7 11½	9 0½	7 3½
(4.) Number of passengers carried one mile.	No. 533,718,529	No. 53,216,819	No. 308,547,000	No. 153,142,000	No. 143,498,330	No. 69,270,000	No. 156,200,000
(5.) Average sum received for carrying a passenger one mile.	d. 383	d. 413	d. 376	d. 372	d. 359	d. 376	d. 241
(6.) Average number of passengers in a train at any one time.	No. 227	No. 213	No. 204	No. 209	No. 268½	No. 288	No. 363
(7.) Average number of passenger trains per diem each way, supposing each train to traverse the whole line open.	No. 2½2	No. 1½3	No. 1½4	No. 1½7	No. 1½9	No. 2½8	No. 1½75
(8.) Average number of passengers passing over each mile of line daily (both ways).	No. 1,142	No. 651	No. 668	No. 490	No. 954	No. 1,501	No. 781
(9.) Total working expenses for both goods and passengers, deducting telegraph special and miscellaneous and demurrage receipts from them.	£ 922,402	£ 94,734	£ 1,073,320	£ 398,291	£ 319,857	£ 126,448	£ 186,150
(10.) Average cost of running a train mile, passenger and goods miles assumed to cost the same.	s. d. 2 10	s. d. 3 2½	s. d. 3 9½	s. d. 3 5	s. d. 5 7½	s. d. 4 7	s. d. 3 4½
(11.) Average cost of carrying a passenger one mile.	d. 15	d. 18	d. 224	d. 196	d. 252	d. 191	d. 1113

(b) GOODS TRAFFIC.

	No.	No.	No.	No.	No.	No.	No.
Average length open, miles	1,280	223½	1,266½	858	412 aver.	158	548
(1.) Receipts from goods traffic	2,055,560	128,266	1,630,891	393,204	385,894	179,663	163,633
(2.) Goods train miles run	No. 4,157,582 s. d.	No. 341,716 s. d.	No. 4,109,361 s. d.	No. 1,601,474 s. d.	No. 604,329 s. d.	No. 310,969 s. d.	No. 675,560 s. d.
(3.) Average goods train mile receipts.	9 10½	7 6	8 2½	4 11	12 9½	11 6½	4 10
(4.) Tons of goods carried one mile.	Tons. 551,427,750	Tons. 31,885,777	Tons. 362,002,057	Tons. 83,144,640	Tons. 71,023,440	Tons. 36,378,280	Tons. 44,587,040
(5.) Average sum received for carrying one ton one mile.	d. 895	d. 965	d. 1115	d. 1135	d. 1304	d. 1135	d. 881
(6.) Average number of tons in a goods train at one time.	No. 132½7	No. 93½3	No. 88	No. 52	No. 117	Tons. 117	No. 66
(7.) Average number of goods trains per diem each way, supposing each train to run over the whole line open.	No. 4½45	No. 2½09	No. 4½45	No. 2½56	No. 2½01	No. 2	No. 1½636
(8.) Average number of tons of goods passing over each mile of line daily (both ways).	No. 1,180	No. 390	No. 783	No. 265	No. 472	No. 631	No. 223
(9.) Total working expenses for both goods and passengers, deducting from them telegraph, special and miscellaneous and demurrage receipts.	£	£ 94,734	£ 1,073,320	£ 398,291	£ 319,857	£ 126,448	£ 186,150
(10.) Average cost per train mile, goods and passenger miles assumed to cost the same.	s. d. 2 10	s. d. 3 2½	s. d. 3 9½	s. d. 3 5	s. d. 5 7½	s. d. 4 7	s. d. 3 4½
(11.) Average cost of carrying a ton of goods one mile.	d. 255	d. 41	d. 52	d. 788	d. 575	d. 47	d. 612

It will be seen that the best passenger train load (363 persons) is obtained on the Oude and Rohilkund, where also the average rate charged for passenger mile is also the lowest ($\cdot 241d.$ —less than one farthing) per mile. The worst average train load (204) was obtained on the Great Indian Peninsula, where the average rate was ($\cdot 376d.$) more than $\frac{3}{8}d.$ per mile.

The best average goods train load was obtained on the East Indian Main line (132·7 tons), where also the average charge per ton, per mile ($\cdot 895d.$) was lowest but one, the lowest being the Oude and Rohilkund ($\cdot 881d.$). The worst average load (52 tons) was, as last year, on the Madras line, its average rate per ton per mile being $1\cdot 135d.$

The lowest cost per train mile (2s. 10d.) is found on the East Indian Main line, the highest (5s. 7d.) on the Bombay and Baroda.

The lowest cost of carrying a passenger one mile ($\cdot 1113d.$) is found on the Oude and Rohilkund, the highest on the Bombay and Baroda ($\cdot 252d.$).

The lowest cost of carrying a ton of goods a mile ($\cdot 256d.$) is found on the East Indian, the highest on the Madras ($\cdot 788d.$).

The largest passenger traffic (1,201 persons, per mile, per diem) is found on the Eastern Bengal, the smallest (490) on the Madras.

The largest goods traffic (1,180 tons per mile per diem) is found on the East Indian Main Line, the smallest (223 tons) on the Oude and Rohilkund.

All the lines show a considerable improvement over last year in the amount of traffic, and in the cost of working it, though the great variations between them show that there is still large room for improvement to be effected, mainly through the reduction of rates and the increase of train loads.

94. The following tables give the rates charged for passengers and goods. It will be observed that, besides having five separate classes, there are special rates, which are generally lower than the lowest class. These are made under what are supposed to be exceptional circumstances, and are especially applied to long distances and to the staples of the country, such as grain, seeds, coal, rice, salt. It would seem desirable to introduce a more simple arrangement than this.

95. The quantities of the principal articles carried during each of the last two years are given in other tables, the classes to which the articles belong being specified.

FARES and RATES in use on the INDIAN RAILWAYS.

Railway.	Passengers.					Goods.					
	Fare for travelling One Mile.					Rate for conveying One Ton One Mile.					
	First Class.	Second Class.	Intermediate Class.	Third Class.	Fourth or Coolie Class.	Of First or Lowest Class.	Of Second Class.	Of Third Class.	Of Fourth Class.	Of Fifth or Highest Class.	Special.
GUARANTEED.	pies.*	pies.	pies.	pies.	pies.	pies.	pies.	pies.	pies.	pies.	pies.
Indian, Main line.	18	9	4½	3	—	9·073	13·61	18·146	22·685	27·221	From 4·537 to 9·073.
Indian, Jubhpore Line.	18	9	4½	3	—	9·073	13·61	18·146	22·685	27·221	From 4·537 to 9·073.
Indian Peninsula.	18	9	—	4	2½	10	14	24	34	48	From 5·5 to 8.
Single -	18	7	—	3½	2	10	14	18	24	36	From 5 to 8.
Return -	27	10½	—	4¾	—	—	—	—	—	—	—
Baroda, and Central India.	15	7	Third Class. Mail 4	Ordinary 3	—	10	15	21	30	40	Up to 8.
Punjab, and Delhi.	18	9	4½	3	—	9·07	13·61	18·14	22·68	27·22	From 6·80.
Indian -	8	3	—	2	—	12	—	—	24	54	From 6 to 10.
ern Bengal -	12	6	—	4½	3	9·79	13·49	16·86	25·53	49·31	From 4·40 to 9·57.
and Rohilkund	Upper 9	Upper Reserved Comptmnt. 36	Lower 2	L. Reserved Comptmnt. 3	Lower Reserved 16 & 24	Low 6·08	Middle 13·62	—	—	High 27·22	5·40.
STATE.	Upper 9	Lower 3	Special 2	—	—	—	—	—	—	—	Average 7·15.
utta and South-eastern.	Average 17·61	Average 5·23	Average 3·52	—	—	Average 13·41	Average 21·92	Average 30·62	Average 51·44	Average 87·49	Average 11·25.
ati -	18	9	—	4	2½	10	14	24	34	48	5·5 to 8.
caoti -	18	9	—	4	2½	10	14	24	34	48	5·5 to 8.
ngaon -	9·89	4·13	—	2·11	—	13·49	19·17	27·20	—	—	7 to 37·02.
utana -	18	9	—	4	2½	10	14	24	34	48	5·5 to 8.
dha Valley -	11·79	4·42	—	2·21	—	—	—	—	—	—	From 6·35 to 8·35.
ation to station rates† -	8 annas	3 annas	—	1½ anna	—	—	—	—	—	—	—
to ditto‡ -	14·77	7·38	3·69	2·30	—	13·33	19·87	26·67	—	—	From 6·35 to 8·35.
8 annas 4 annas 2 annas 1½ anna -	8 annas	4 annas	2 annas	1½ anna	—	—	—	—	—	—	—
jab, Northern -	9·32	4·66	—	1·74	—	10·48	15·72	20·96	—	—	5·45 to 6·13.
ut -	12·70	5·17	—	2·11	—	11·77	19·64	27·38	—	—	From 6·76.
m's -	18	9	—	4	2½	10	14	24	34	48	5·5 to 9.
much -	10·37	5·19	2·59	1·62	—	—	—	—	—	—	—
§ 8 annas 4 annas 2 annas 1½ anna -	8 annas	4 annas	2 annas	1½ anna	—	—	—	—	—	—	—

* 8 pies = 1d.

† The rates in use on the section of 57 miles, Khandwa to Choral.

‡ The rates in use on the section of 13 miles, Mhow to Indore, opened on 3rd August 1876 for passenger traffic only.

§ Station to station rate.

STATEMENT showing the QUANTITIES of the principal Articles of MERCHANDISE &c., carried on the GUARANTEED RAILWAYS in 1875 and 1876.

Articles.	Class.	East Indian, Main Line.		East Indian, Jubbulpore Line.		Great Indian Peninsula.		Madras.		Bombay, Baroda, and Central India.		Sinde, Punjab, and Delhi.		Eastern Bengal.		Oude and Rohilkund.		South Indian.	
		1876.	1875.	1876.	1875.	1876.	1875.	1876.	1875.	1876.	1875.	1876.	1875.	1876.	1875.	1876.	1875.	1876.	1875.
Cloth	2nd	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Coal	Special	See piece goods.	520,261	515,904	6,424	9	654	178	494	1,483	1,576	639	730	6,563	4,443	3,189	1,987	4,070	2,312
Cocoa-nuts	2nd	See dried fruits.			10,203	10,362		3,466	2,991	5,763	4,529	602	Not separately abstracted in 1875.					Areca nuts.	
Coffee	3rd							6,044	4,940	25	21	46	50					3,197	2,379
Cotton	2nd	27,984	33,867	1,535	1,676	84,721	101,279	23,475	30,602	47,533	50,139	7,871	9,407	750	505	8,209	6,275	7,079	4,625
Dried Fruits	2nd	Including cocoa-nuts																Stuffs	
Firewood	2nd	5,646	5,430	2,368	2,911	13,794	13,867	10,369	11,520	5,111	5,374	6,253	6,974						
Grain	1st	13,111	13,532	13,142	11,530	43,266	34,377	10,389	11,520	5,266	5,534	9,469	14,131			9,141	12,002		
or spec.	1st	195,452	69,986	45,414	18,114	424,515	215,784	116,421	47,474	62,923	44,384	91,628	65,700	12,365	14,271	154,846	75,302	68,650	41,940
Gunny Bags	2nd													5,845	6,437				
Green Fruits and Vegetables.	2nd																		
Hides	2nd	Including skins				16,505	14,029	4,689	5,187	11,088	8,968	3,843	3,145			1,634	1,668	2,853	2,496
Iron	1st	54,184	39,875	3,352	3,769													1,637	1,213
Jaggree and Sugar	2nd	Including molasses				28,257	25,686	11,682	14,169	28,388	27,909	47,575	36,906	9,350	7,389	71,278	40,713		
Jute	2nd	Including molasses				24,939	32,899			8,197	7,800			144,370	94,694	553	320		
Metal and Hardware	3rd	Including hemp and flax				9,062	7,591	4,647	3,556	1,928	1,665	10,412	11,068	968	667	4,184	3,618		
Military Stores	3rd	614	620	268	231					2,300	1,422	2,491	Not separately abstracted in 1875.	135	212	4,662	7,032		
Oil	2nd	4,230	3,517	366	86	8,667	10,115	7,080	6,758							675	648	and ghee	
Opium	3rd	9,496	6,531			4,245	3,426			936	1,254	59		16	16	1,163	523	3,215	2,123
Piece Goods	—	Including cloth				17,371	17,381			7,617	7,689	10,446	9,903	10,370	10,263	8,939	3,692	Oil cakes	
Rice	1st	174,065	110,057	11,116	2,051			101,243	75,118	Included in grain.			Not abstracted separately in 1875.	15,482	22,840			6,124	2,639
Salt	or spec.	154,223	143,919	6,442	6,609	81,491	70,572	51,471	47,996	43,950	38,246	17,210	11,055	15,337	3,776	40,015	36,603		
Seeds	1st	202,797	159,714	19,638	11,296	159,371	117,015	19,232	16,921	35,157	28,528	78,437	60,184	28,608	22,081	17,808	10,306	11,609	7,508
Silk	or spec.									Included in piece goods.								Sumdries.	
Tea	2nd	658	718	68	118	530	697					85	122	118	117				
Timber	4th									19,494	8,981	5,750	3,719	420	1,170				
Tobacco	2nd	60,235	13,917	398	6,401	11,343	22,406	15,153	17,327	6,518	8,100	1,151	947	12,074	18,839				
Twist	3rd	10,117	8,930	822	1,064	2,982	3,677	6,272	6,127	2,188	2,183	1,491	1,280	11,251	9,017	616	557	1,154	892
Turneric	2nd	3,201	2,729	681	383	5,569	5,769	5,002	4,389					4,083	2,674	731	627		
Wines, Spirits, &c.	2nd	6,497	8,979	581	398	3,753	4,001	2,556	2,920	645	619	2,347	2,717	316	381	2,309	2,455		
Wool	2nd					588	211			2,476	2,185	6,526	5,798			(not included in above).			
																102,166	74,178		

STATEMENT showing the QUANTITIES of the principal Articles of Merchandise, &c., carried on the STATE RAILWAYS in 1873 and 1876.

Articles.	Classes.		Calcutta and South Eastern.		Nalhati.		Amraoti.		Khangoon.		Nizam's.		Wardha Valley.		Tirhut.		Punjab, Northern.		Rajputana.		Holkar's.		Neemuch.	
	1876.	1875.	1876.	1875.	1876.	1875.	1876.	1875.	1876.	1875.	1876.	1875.	1876.	1875.	1876.	1875.	1876.	1875.	1876.	1875.	1876.	1875.	1876.	
Cloth	—	—	153	7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Included in piece goods.	—	—	—	—	
Coal	3	42	4,170	4,797	11	—	1	—	—	—	27	—	1,040	—	1,234	—	—	—	232	139	—	—		
Cocon-nuts	—	—	—	—	883	—	67	—	—	—	176	—	72	—	—	—	—	—	Included in dry fruits.	—	—	—	—	
Coffee	—	—	—	—	2	—	—	—	{ 49 and tea. }	—	—	—	—	—	—	—	—	—	7,658	9,022	—	—		
Cotton	—	—	346	237	10,767	—	13,404	—	—	—	86	—	1,498	—	192	—	95	19	1,637	1,103	—	—		
Dried Fruits	—	—	215	29	1,426	—	95	—	—	—	1,102	—	114	—	31	—	513	303	Not carried.	—	—	—	—	
Firewood	—	—	—	—	—	—	55	—	—	—	2,918	—	—	—	291	—	179	—	{ 15,034 and pulses. }	24,022	22,376	33,508		
Grain	7	—	539	319	11,038	—	3,762	—	—	—	17,642	—	516	—	12,304	—	6,906	877	373	233	737	467		
Green Fruits and Vegetables	—	—	—	—	79	—	13	—	—	—	817	—	—	—	—	—	550	135	—	—	—	—		
Hay	3,623	2,709	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	{ 1,182 and leather. }	922	265	74		
Hides	—	—	30	27	{ 49 and horns. }	—	{ 5 and horns. }	—	—	—	{ 927 and horns. }	—	2	—	475	—	529	194	{ Included in metal and hardware. }	—	—	—	—	
Iron	46	13	46	59	—	—	—	—	—	—	—	—	—	33	—	92	—	35,917	19,679	4,989	4,772			
Jaggree and Sugar	—	—	343	162	698	—	203	—	—	—	909	—	80	—	321	—	2,042	—	{ 182 and flax. }	—	—	—	—	
Jute	40	73	7	9	—	—	—	—	—	—	—	—	—	4	—	65	—	—	—	—	—	—		
Metal and Hardware	—	—	152	153	568	—	302	—	—	—	988	—	97	—	36	—	395	113	2,130	2,574	1,346	1,210		
Military Stores	—	—	—	—	12	—	—	—	—	—	1,166	—	15	—	—	—	1,203	—	896	12	1,302	1,273		
Miscellaneous	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6,306	4,978		
Oil	—	—	24	12	39	—	4	—	—	—	405	—	—	—	2	—	380	129	{ 592 and ghee. }	182	440	275		
Opium	—	—	5	6	29	—	5	—	—	—	82	—	—	—	—	—	—	—	Not carried.	—	3,621	2,009		
Piece Goods	—	—	934	836	614	—	62	—	—	—	1,014	—	114	—	204	—	1,122	213	2,643	1,763	2,134	1,776		
Railway Materials	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11,393	14,535		
Rice	516	105	1,453	769	—	—	—	—	—	—	—	—	—	—	9,735	—	216	5	Included in grain.	—	—	—	—	
Salt	—	—	350	567	3,760	—	1,375	—	—	—	11,523	—	2,383	—	1,364	—	5,370	15	80,533	72,888	—	—		
Seeds	—	—	617	1,222	3,350	—	591	—	—	—	5,752	—	4,898	—	3,007	—	—	—	2,126	813	—	—		
Straw	750	563	—	—	—	—	—	—	—	—	—	—	—	—	—	—	29	—	—	—	—	—		
Silk	—	—	467	450	10	—	—	—	—	—	14	—	—	—	—	—	—	—	—	—	—	—		
Sundries	1,671	723	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
Timber	—	—	{ 1,745 and 4. }	1,679	447	—	16	—	—	—	775	—	9	—	213	—	2,502	261	884	530	—	—		
Tobacco	—	—	22	13	67	—	—	—	—	—	94	—	—	—	1,297	—	47	20	560	290	1,090	1,550		
Twist	—	—	—	7	137	—	3	—	—	—	298	—	13	—	—	—	—	—	Included in piece goods.	—	—	—	—	
Wines, Spirits, &c.	—	—	34	45	42	—	11	—	—	—	331	—	10	—	30	—	924	216	163	143	362	294		
Wool	—	—	3	—	—	—	—	—	—	—	6	—	—	—	—	—	256	76	136	175	—	—		
Wooloo	1,556	3,224	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		

* Six months only.

† As miscellaneous in official accounts.

In future the list of commodities will be kept, as far as possible, under the heads herein given.

STATEMENTS relating to the PASSENGER and GOODS TRAFFIC and the GROSS

TABLE NO. 1.—STATEMENT of TRAFFIC on the INDIAN

Railway.	Actual Number of Miles open on 31st December, and Average Number of Miles of Open Line during 1876.						Number of Miles of Sidings on 31st December 1876.	Passenger Traffic.						
								Number of Passengers (exclusive of Holders of Season and Periodical Tickets).						Number of Holders of Season and Periodical Tickets.
	Double.		Single.		Total			By First Class.	By Second Class.	By Intermediate Class.	By Third Class.	By Fourth or Coolie Class.	Total by all the Classes.	
	Actual.	Average.	Actual.	Average.	Actual.	Average.								
GUARANTEED.														
East Indian, Main Line	410½	410½	869	869	1,279½	1,279½	280½	48,159½	122,904	490,559½	5,635,182	—	6,296,805	10,612½
East Indian, Jubbulpore Line	—	—	223½	223½	223½	223½	21½	5,447	21,474½	9,651½	268,237½	—	304,810½	—
Great Indian Peninsula	325	325	943½	943½	1,268½	1,268½	203½*	27,898	117,513½	—	476,402	3,243,710	3,865,523½	899
Madras	3½	2½	858	858	861½	860½	90½	12,622½	48,834½	—	1,763,196½	973,875	2,738,528½	115
Bombay, Baroda, and Central India	23½	23½	416	407½	439½	430½	74½	18,497	158,153	—	Third Class Mail 395,671	Ordry. 3,752,827	4,325,148	6,208
Scinde, Punjab, and Delhi	4½	4½	659	659	663½	663½	103½	19,171	48,978½	27,725	2,325,108½	—	2,415,983	2
South Indian	—	—	475	423	475	423	38	8,491	68,336½	—	2,744,187	—	2,821,014½	3
Eastern Bengal	—	—	158½	158½	158½	158½	—	30,103	54,462	—	330,368	1,323,373½	1,738,306½	2,594
Oude and Rohilkhund	—	—	548†	548	548	548	55½ {	Upper 20,216½	—	— {	Lower 2,536,329½	—	2,556,546	—
STATE.														
Calcutta and South-eastern	—	—	28	28	28	28	6½ {	Upper 8,861½	—	— {	Lower 513,940	—	517,801½	—
Nulhati	—	—	27½	27½	27½	27½	1½	970½	5,704	—	94,199	—	100,873½	—
Berar {	Amraoti	—	—	6	6	6	½	658	2,069	—	31,799	31,082½	65,608½	—
	Kamgaun	—	—	7½	7½	7½	½	199	274½	—	2,122	6,688½	9,279	—
Nizam's	—	—	121	121	121	121	7	2,255	7,090½	—	15,465½	190,992	215,808	—
Wurdha Valley	—	—	18	18	18	18	1½	123½	201	—	1,184	10,066½	11,575	—
Tirhoot	—	—	45½	45½	45½	45½	5	1,160	1,939	—	116,203	—	119,332	—
Punjab, Northern	—	—	103	90½	103	90½	7½	2,730	9,746	—	689,001	—	701,477	—
Rajputana	—	—	396½	394½	396½	394½	37½	4,543	16,808	—	1,274,246	—	1,295,597	—
Holkar's	—	—	70	62½	70	62½	9	1,998	9,413	2,732	276,783	—	290,926	3
Neemuch	—	—	37	37	37	37	3½	204	884	1,181	75,820	—	78,039	1
Totals for Railways	767	766	6,010½	5,928	6,777½	6,694	948½	208,808	684,815½	531,849	19,565,444½	9,532,610	30,523,527	20,437½
Indus Steam Flotilla	—	—	—	—	—	—	—	257½	260½	—	11,334	—	11,792	—
Totals for Railways and Flotilla	—	—	—	—	—	—	—	209,065½	685,016	—	19,576,778½	—	30,535,319	—

* Campoolie and Mowpani Branches treated as sidings.

† Including Nurora Branch (4 miles)

RECEIPTS and EXPENSES for the Year ended 31st December 1875.

RAILWAYS during the Year ended 31st December 1876.

Goods Traffic.											
Number of Live Stock.	Number of Tons of Minerals.			Number of Tons of General Merchandise.							Railway.
	Number of Tons of Coal and Coke.	Number of Tons of all other Minerals.	Total Number of Tons of Minerals.	Of First or Lowest Class.	Of Second Class.	Of Third Class.	Of Fourth Class.	Of Fifth or Highest Class.	Special and Sundry.	Total of all Classes.	
											GUARANTEED.
11,797	520,261	—	520,261	1,085,923	153,765	47,922	24,200	4,755	81,402	1,897,967	East Indian, Main Line.
13.	6,424	—	6,424	170,645	17,046	7,297	1,550	310	5,397	208,145	East Indian, Jubbul-pore Line.
303,416	638	—	638	152,532	166,318	30,844	27,280	5,467	795,712	1,178,153	Great Indian Penin-sula.
12,885	—	—	—	140,112	51,318	24,926	6,237	5,184	376,876	614,153	Madras.
200,382	{ 1,483 29,935* }	32,944†	64,362	108,215	48,405	46,615	1,141	1,396	239,184	444,956	Bombay, Baroda, and Central India.
594	854	—	854	81,975	61,454	26,847	14,558	2,113	309,418	496,365	Scinde, Punjab, and Delhi.
6,321	—	—	—	64,103	—	—	1,470	105	133,921	199,599	South Indian.
2,125	6,583	2,396	8,959	18,981	52,581	5,076	1,926	163	216,527	295,254	Eastern Bengal.
250	3,189	—	3,189 {	Low 62,962	Middle 31,053	High 2,703	} —	—	342,034	438,752	Oude and Rohilkhund.
											STATE.
88	3½	—	3½	—	—	—	—	—	29,963	29,963	Calcutta and South-eastern.
—	4,170	—	4,170	3,423	1,277	1,230	384	23	1,187	7,524	Nulhati.
—	2	—	2	3,082	14,879	1,082	103	53	19,355	38,554	Amraoti - } Berar.
—	—	—	—	919	13,726	143	12	8	5,890	20,698	Kamgaun - }
456	6	—	6	4,871	7,193	2,716	260	218	44,171	59,429	Nizam's.
—	1,040	—	1,040	1,746	2,097	108	15	1	8,350	12,317	Wurdha Valley.
26	1,234†	—	1,234	12,707	683	516	—	—	22,781	36,687	Tirhoot.
—	—	—	—	21,230½	4,760	5,506	—	—	71,463½	100,960½	Punjab, Northern.
24	275	—	275	140,987	4,563	1,477	—	—	15,868	162,895	Rajputana.
7	—	—	—	37,787	4,093	4,305	—	—	11,393	57,578	Holkar's.
—	—	—	—	—	—	—	—	—	—	—	Neemuch.
588,324	576,077½	35,340	611,417½	2,121,200½	686,311	207,313	79,136	19,796	2,731,192½	5,794,949½	Totals for Railways.
—	—	—	—	—	—	—	—	—	—	72,314	Indus Steam Flotilla.
—	—	—	—	—	—	—	—	—	—	5,867,263½	{ Totals for Railways and Flotilla.

* On Company's account.

† Includes 1,047 tons of coal for consumption.

‡ Company's own materials.

TABLE NO. 2.—STATEMENT OF TRAFFIC ON THE INDIAN RAILWAYS

Railway.	Number of Engines and Vehicles used in conveying Traffic.												Number of Miles travelled in shunting piloting						
	Carriages.							Average Number of Vehicles in each Train.					By Passenger (including Special and Troop) Trains.	By Goods (including Construction Materials for other Railways) Trains.	By Mineral Trains.	By Mixed Passenger and Goods Trains.			
	Engines.	First Class.	Second Class.	Intermediate Class.	Third Class.	Fourth Class.	Total Number.	Trucks.	Carriages in each Passenger Train.	Trucks in each Goods Train.	In each Mixed Passenger and Goods Train.								
											Carriages.	Trucks.				(P.)	(G.)		
GUARANTEED.																			
East Indian, Main Line	450	84	85	132	322	—	623	5,387	16½	29½	16	7½	1,235,587	3,584,033	226,854	1,119,565	346,695		
East Indian Jubbulpore Line	40	8	14	4	30	—	56	881	14½	24½	8½	17½	177,488	250,188	—	72,334	91,327		
Great Indian Peninsula	331	79	146	composite 87	369	67	748	6,760	15	27	9	18	1,201,572	3,690,488	—	313,043	418,873		
Madras	100	30	57	composite 30	196	33	346	2,756	9	17	6	9	14,293	679,774	—	717,683	921,700		
Bombay, Baroda, and Central India	64	13	25	composite 16	171	—	225	2,436	9·4	42·6	11	14·8	414,633	442,897	—	123,574	161,432		
Scinde, Punjab, and Delhi	67·10	44	55·84	21·67	212·07	—	3·58	2,650·15	13·52	34·80	9·83	19·14	327,243	551,169	—	329,650	186,443		
South Indian	93	37	20	Royal saloon 3	213	—	366	1,400	—	—	22		—	—	—	596,540			
Eastern Bengal	38	29	16	—	40	61	146	696	14	40	4	31	187,330	167,354	—	52,945	143,615		
Oudh and Rohilkund	63	Upper 17	—	composite 29	Lower 207	—	253	1,254	18·88	24·04	11	11	10,315	298,526	—	419,943	377,034		
STATE.																			
Calcutta and South-eastern	5	Upper 4	—	—	Lower 37	—	41	168	14	20	8	20	20,550	224	—	10,638	10,638		
Nalhati	4	1	—	—	4	—	6	15	—	—	5	6	—	—	—	2,123	16,084		
Berar {	Amraoti	2	—	—	composite 1	2	2	5	33	2·5	22	6	11	6	570	—	1,485	2,907	
	Khamgaun	2	—	—	composite 1	2	2	5	33	15	20	4·5	12·5	—	208	—	1,067	2,341	
Nizam's	5	4	6	composite 1	10	10	31	70	18	24·5	13·5	14·5	2,432	64,938	—	48,723	39,340		
Wardha Valley	1	—	—	composite 1	2	2	5	23	6·5	17·5	4	12	38	1,900	—	1,015	1,037		
Tirhoot	7	—	—	composite 2	*11	—	13	140	—	—	9·87	12·74	275	184	By construction train 31,455	15,400	23,101		
Punjab, Northern	11·75	6	6	—	43	—	55	230	—	29·29	11·14	5·48	—	43,437	—	82,144	50,041		
Rajputana	54	39	11	—	105	—	155	959	71·	26·1	12·38	9·12	8,885	177,007	—	319,414	215,568		
Holkar's	20	and saloon 6	4	—	59	break vans 7	76	257	10	25	8	14	25,479	51,157	—	15,143	17,668		
Neemuch	1	1	1	—	9	break vans 2	13	8	—	—	—	—	11,224	—	—	—	—		
Totals	—	—	—	—	—	—	—	—	—	—	—	—	3,664,350	10,004,054	258,309	3,667,394	3,027,500		
																596,540			
																7,291,940			

* Includes seven cattle vans, used as 3rd class carriages

for the Year ended 31st December 1876—continued.

ins (except sisting).			Number of Ton Miles (expressed in the Number of Tons moved One Mile).												Railway.	
Total Number of Train Miles.	Number of Train Miles per open Mile.	Excess Luggage, Parcels, Carriages, Horses, Dogs, &c. conveyed in Passenger Trains.	Goods Traffic.													
			Minerals.	General Merchandise.							Total Mineral and General Merchandise.	Proportion of Up and Down Traffic.				
				First or Lowest Class.	Second Class.	Third Class.	Fourth Class.	Fifth Class.	Special and Sundry.	Total of all Classes.		Up.	Down.			
2	6,631,826	5,182'13	Lug. and parcels. 2,884,777 1,825,423	96,148,625	338,395,692	63,022,650	17,197,693	8,646,245	1,335,846	26,480,999	455,279,125	551,427,750	36°74'	63°26'	GUARANTEED. East Indian, Main Line.	
4	594,383	2,656°46'	Lug. and parcels. 488,140 cargos., &c. 180,740	1,438,768	24,015,080	3,602,255	1,403,951	320,502	64,637	1,040,584	30,447,009	31,865,777	81	19	East Indian, Jubbul- pore Line.	
	5,623,976	4,434	—	108,893	36,667,717	52,101,461	8,983,894	6,606,458	1,896,015	253,639,942	359,895,487	360,004,385	67	33	Great Indian Penin- sula.	
	2,333,450	2,720	1,162,704	—	25,520,978	9,108,944	4,182,778	1,328,571	633,842	42,058,669	82,833,782	82,833,782	55°53'	44°47'	Madras.	
8	1,225,554	2,845	Luggage only. 386,531	7,956,670	18,622,956	10,316,102	12,294,938	198,913	376,651	25,500,508	67,310,068	75,266,738	55°65'	44°25'	Bombay, Baroda, and Central India.	
0	1,495,254	2,253	679,840	170,877	11,561,395	10,128,242	4,183,224	2,037,195	363,120	39,760,013	68,033,189	68,204,066	70	30	Scinde, Punjab, and Delhi.	
3	622,808	—	126,837	—	4,762,765	—	—	136,414	10,331	9,631,451	14,540,961	14,667,818	44	56	South Indian.	
	551,244	3,483	189,396	623,193	1,453,648	6,358,671	481,019	217,659	22,177	26,714,921	35,748,095	36,371,288	16°87'	63°13'	East Bengal.	
4	1,117,692	2,039	524,302	108,429	Low 6,924,769	Middle 3,905,948	High 357,170	—	—	23,633,964 3,799,558	43,621,409	43,729,838	—	—	Oude and Rohilkhund.	
	42,154	1,505	3,163	98	—	—	—	—	—	701,619	701,619	701,707	98°83'	1°17'	STATE. Calcutta and South eastern.	
	40,396	1,482	7,586	113,136	68,667	34,508	33,181	10,350	620	32,339	179,665	292,801	79°07'	20°33'	Nulhati.	
	4,968	828	—	13	18,489	89,274	6,493	619	321	116,126	231,322	231,335	68	32	Amraoti	
	3,616	467	—	—	7,354	109,810	1,141	98	61	47,122	165,586	165,586	85	15	Kamgaun }	
	155,942	1,289	—	724	485,510	748,390	303,734	24,018	23,674	3,870,949	5,456,275	5,456,999	20	80	Nizam's.	
	4,940	274	—	19,759	33,143	39,831	2,067	277	24	158,168	233,510	253,269	62	38	Wurdha Valley	
	70,503	1,649°51'	16,519	26,364	515,520	29,621	21,246	—	—	864,297	1,430,684	1,457,048	75°05'	24°95'	Tirhoot.	
	177,625	6,724°51'	79,264	—	1,425,621	349,719	240,614	—	—	1,459,485	3,475,439	—	46°58'	56°42'	Punjab, Northern.	
	762,769	1,926	516,468	48,676	15,136,935	712,354	234,593	—	—	6,083,573	22,167,955	22,211,631	45°73'	54°27'	Rajputana.	
	139,087	2,230	36,336	—	1,981,987	218,676	239,306	—	—	617,244	3,067,213	3,067,213	13°12'	86°68'	Holkar's.	
	11,224	303	7,884	—	—	—	—	—	—	—	—	—	—	—	Neemuch.	
	21,609,411	—	8,715,930	106,759,225	487,798,226	161,376,956	50,167,042	19,527,319	4,727,319	471,211,531	1,194,803,393	1,298,219,031	—	—	Totals	

TABLE NO. 3.—GROSS RECEIPTS of the INDIAN RAILWAY

Railway.	Passenger Traffic.												Receipts from Live Stock.	Receipts from		
	Receipts from Passengers.							Total Receipts from Excess Luggage, Parcels, Carriages, Horses, Dogs, &c. conveyed in Passenger Trains.	Receipts for Mail Service.	Receipts from Special Trains.	Receipts from Troop Trains.	Total Receipts from Passenger Traffic—(P.)		Passenger Receipts per Train Mile.	From Coal and Coke.	From other Minerals.
	First Class.	Second Class.	Intermediate Class.	Third Class.	Fourth or Coolie Class.	Holders of Season or Periodical Tickets.	Total Receipts from Passengers.									
GUARANTEED.	£	£	£	£	£	£	£	£	£	£	£	£	s.	£	£	£
East Indian, Main Line - - -	45,702	39,538	40,807	586,027	—	4,472	716,546	75,979	3,326	34,257	20,981	851,089	7*227	1,312	245,295	—
East Indian, Jubbulpore Line - - -	6,096	5,205	2,453	51,795	—	—	65,549	7,879	977	10,034	7,173	91,612	7*334	8	3,248	—
Great Indian Peninsula - - -	88,134	56,112	—	111,390	203,525	1,049	410,210	63,271	1,699	8,194	—	483,374	6*88	7,520	49	—
Madras - - -	14,455	14,754	—	140,850	38,733	120	208,912	25,159	—	3,299	—	237,370	6*486	2,134	—	—
Bombay, Baroda, and Central India - - -	4,935	10,306	—	Third class. Mail Train 51,361	Ordinary 125,553	3,958	196,118	14,125	165	384	3,738	214,530	7*97	11,260	609	*5,650
Scinde, Punjab, and Delhi - - -	14,718	13,844	5,121	163,721	—	7	197,411	25,522	1,032	1,780	—	225,745	6*87	263	546	—
South Indian - - -	1,816	3,616	—	102,593	—	7	108,032	4,938	—	432	—	113,402	3*80	332	—	—
Eastern Bengal - - -	3,870	3,211	—	21,248	68,411	1,361	98,101	10,064	70	273	—	108,508	9*03	33	1,747	144
Oudh and Rohilkhand - - -	Upper 7,462	—	—	Lower 136,834	—	—	144,296	11,405	—	1,150	—	156,851	7*29	60	323	—
STATE.	Upper 206	—	—	Lower 6,498	—	—	6,704	229	—	4	—	6,937	4*45	9	1	—
Calcutta and South-eastern - - -	226	412	—	3,716	—	—	4,354	432	13	17	—	4,816	3*97	—	679	—
Berar { Amraoti - - -	28	50	—	366	225	—	669	43	—	—	—	712	9*55	—	1	—
{ Kamgaun - - -	12	9	—	32	67	—	120	15	—	—	—	135	2*53	—	—	—
Nizam's - - -	1,482	2,140	—	2,870	13,460	—	19,952	2,673	—	592	—	23,217	9*08	16	3	—
Wardha Valley - - -	18	14	—	42	226	—	300	19	—	—	—	319	6*06	—	57	—
Tirhoot - - -	284	193	—	4,342	—	—	4,799	273	—	44	—	5,116	6*53	1	130	—
Punjab, Northern - - -	820	1,161	—	21,088	—	—	23,069	1,697	—	896	—	25,662	6*248	—	—	—
Rajputana - - -	1,910	2,777	—	71,275	—	—	75,962	7,251	—	894	—	84,107	5*124	25	280	—
Holkar's - - -	388	661	65	8,615	—	7	9,736	831	—	242	—	10,809	3*20	1	—	—
Neemuch - - -	34	71	44	1,924	—	8	2,081	152	—	18	—	2,251	4*01	—	—	—
Totals for Railways	142,576	154,074	48,490	1,466,587	450,205	10,989	2,292,921	251,957	7,282	62,510	31,892	2,646,562	—	22,979	253,614	5,794
Indus Steam Flotilla	2,595	289	—	4,736	—	—	7,620	885	—	—	—	8,505	—	—	—	—
Totals for Railways and Flotilla	145,171	154,363	48,490	1,491,323	450,205	10,989	2,300,541	262,842	7,282	62,510	31,892	2,655,067	—	—	—	—

ring Year ended 31st December 1876.

Goods Traffic.										Total Receipts from Passenger and Goods Traffic—(P.)+(G.)	Passenger and Goods Receipts per Train Mile.	Total Miscellaneous Receipts—(M.)	Miscellaneous Receipts per Train Mile.	Total Receipts from Passengers, Goods, and Miscellaneous—(P.)+(G.)+(M.)	Total Receipts per Train Mile.	Railway.
Receipts from General Merchandise (exclusive of Live Stock and Minerals).	From First or Lowest Class.	From Second Class.	From Third Class.	From Fourth Class.	From Fifth or Highest Class.	From Special and Sunday.	Total.	Total Receipts from Goods Traffic—(G.)	Goods Receipts per Train Mile.							
£	£	£	£	£	£	£	£	£	s.	£	s.	£	s.	£	s.	GUARANTEED.
45,235	1,023,612	396,690	148,682	82,981	17,490	† 142,239	1,811,694	2,058,301	9'901	2,909,390	8'934	100,793	'31	3,010,183	9'244	East Indian, Main Line.
3,243	80,564	22,739	12,085	3,469	856	‡ 5,366	125,079	128,335	7'511	219,947	7'436	25,222	'863	245,169	8'289	East Indian, Jubbulpore Line.
495	185,357	432,907	105,182	78,480	43,954	832,882	1,678,762	1,686,777	8'21	2,170,151	7'72	66,678	'23	2,226,829	7'95	Great Indian Peninsula.
—	121,870	56,277	33,155	14,095	9,988	155,090	390,475	392,609	4'903	629,979	5'399	22,117	'189	652,096	5'589	Madras.
6,259	93,999	63,616	99,233	2,974	7,925	100,627	368,374	385,893	12'77	600,423	10'51	20,370	'36	620,793	10'87	Bombay, Baroda, and Central India.
546	62,266	24,762	37,540	70,551	4,566	141,513	341,198	342,012	9'27	567,757	8'14	22,311	'32	590,068	8'46	Scinde, Punjab, and Delhi.
—	27,931	—	—	1,528	271	38,759	68,489	68,821	2'31	182,223	6'11	8,562	0'29	190,785	6'40	South Indian.
1,891	6,146	43,874	3,881	2,634	527	120,677	177,739	179,663	11'54	288,171	10'45	14,600	'53	302,771	10'98	Eastern Bengal.
323	Low 25,566	Middle 31,530	High 5,121	—	—	101,033	163,250	163,633	4'86	320,484	5'80	20,199	'36	340,683	6'14	Oude and Rohilkhand.
1	—	—	—	—	—	2,616	2,616	\$2,715	5'00	9,652	4'59	182	'09	9,834	4'67	Calcutta and South-eastern.
679	479	393	524	277	28	175	1,876	\$2,663	3'24	7,419	3'67	126	'06	7,545	3'73	Nulhati.
1	584	2,632	243	28	16	2,099	5,600	5,601	32'22	6,313	25'41	57	0'23	6,370	25'64	Amraoti.
—	131	2,029	26	2	2	620	2,310	2,310	22'05	2,945	16'29	14	'08	2,959	16'37	Kamgaun.
3	2,808	5,861	3,693	400	544	16,654	29,960	29,979	5'72	53,196	6'32	128	'02	53,324	6'84	Nizam's.
57	238	504	31	5	1	751	1,530	1,587	8'17	1,906	7'72	8	'03	1,914	7'75	Wurdha Valley.
130	3,162	303	303	—	—	3,019	6,787	6,913	5'94	12,034	6'18	11,910	3'03	17,944	9'21	Tirhoot.
—	8,601	3,059	2,841	—	—	6,835	21,336	21,336	4'565	46,993	5'292	585	'065	47,583	5'357	Punjab, Northern.
280	106,346	7,117	3,323	—	—	81,210	147,996	148,301	7'55	232,403	6'45	4,150	'11	236,553	6'56	Rajputana.
—	14,549	2,431	3,594	—	—	2,888	23,462	23,463	6'82	34,272	5'02	3,567	'51	37,839	5'44	Holkar's.
—	—	—	—	—	—	—	—	—	—	2,231	4'01	6	'01	2,237	4'02	Neemuch.
39,208	1,764,209	1,096,724	459,457	257,422	86,168	1,705,053	5,369,033	\$5,651,357	—	8,297,919	—	315,585	—	8,603,504	—	Total for Railways.
—	—	—	—	—	—	—	—	132,303	—	140,813	—	—	—	140,813	—	Indus Steam Flotilla.
—	—	—	—	—	—	—	—	4,783,665	—	8,438,732	—	315,585	—	8,744,317	—	Totals for Railways and Flotilla.

* From Company's own materials carried on Capital Account.

† Includes 17,447 0s. 10d., being receipts on account of demurrage and wharfage, stowage, &c.

‡ Ditto, 684 3s. 8d., ditto, ditto, ditto.

§ Include goods, miscellaneous earnings, Calcutta and South-Eastern, 897., and Nulhati 487.

|| Includes 5,522½ receipts from construction on account of hire of locomotives and vehicles.

TABLE No. 4.—EXPENDITURE ON REVENUE ACCOUNT

Railway.	Maintenance and Renewal of Way and Works.				Cost of producing Locomotive Power by Wages and Materials.			Repairs and Renewals of Carriages and Waggon.			Coaching and Merchandise.			Collection and Delivery of Goods.			Rates
	Gross.		Per Train Mile.	Per cent. of Gross Receipts.	Gross.	Per Train Mile.	Per cent. of Gross Receipts.	Gross.	Per Train Mile.	Per cent. of Gross Receipts.	Gross.	Per Train Mile.	Per cent. of Gross Receipts.	Gross.	Per Train Mile.	Per cent. of Gross Receipts.	Gross.
	Ordinary.	Special.															
GUARANTEED.	£	£	d.		£	d.		£	d.		£	d.		£	d.		£
East Indian, Main Line -	236,553	—	10'56	9'52	246,976	9'10	8'20	105,075	3'87	3'49	220,511	8'13	7'33	—	—	—	4,94
„ Jubbulpore Line	39,772	—	16'14	16'22	30,784	12'49	12'56	11,798	4'79	4'81	13,183	5'35	5'38	—	—	—	8
Great Indian Peninsula -	156,072	11,783	7'16	7'5	435,387	18'58	19'5	168,881	7'19	7'5	155,670	6'64	7'0	311	0'01	—	1,280
Madras - - -	105,358	20,601	12'95	19'32	148,735	15'30	22'81	36,037	3'71	5'53	60,617	6'23	9'30	358	'04	'06	738
Bombay, Baroda, and Central India.	68,483	46,331	22'48	18'49	94,073	18'42	15'16	28,312	5'54	4'56	51,111	10'01	8'23	1,871	'37	'30	672
Scinde, Punjab, and Delhi -	76,890	54,435	21'030	22'257	107,499	17'214	18'218	28,306	4'533	4'797	59,280	9'492	10'046	5,640	'904	'956	193
South Indian -	Gross 7,111	—	2'74	3'73	47,420	18'27	24'85	18,381	7'08	9'63	16,100	6'20	8'44	—	—	—	271
Eastern Bengal - -	30,647	1,790	14'12	10'72	31,252	13'61	10'33	12,635	5'51	4'18	38,013	16'55	12'56	—	—	—	686
Oudh and Rohilkhund -	41,256	—	8'86	12'09	69,431	14'90	20'35	31,584	6'78	9'28	40,322	8'66	11'82	121	'03	'04	—
STATE.																	
Cutch and South-eastern	1,755	1,597	19'08	34'09	2,888	16'44	29'36	2,028	11'54	20'62	1,144	6'51	11'63	—	—	—	62
Nalhati - - -	1,535	2,235	22'40	50'14	2,357	14'00	31'34	419	2'49	5'57	841	4'99	11'18	—	—	—	15
Berar {	Amraoti - -	Gross 283	—	13'68	4'45	2,037	99'32	32'27	797	38'50	12'50	713	34'47	11'20	—	—	—
	Kamgaun - -	Gross 254	—	16'87	8'59	925	61'42	31'27	358	23'81	12'13	321	21'30	10'85	—	—	—
Nizam's - - -	Gross 12,669	—	19'49	23'76	16,190	24'92	30'36	6,278	9'66	11'77	5,617	8'64	10'53	—	—	—	—
Wardha Valley - -	Gross 568	—	27'59	29'68	836	40'64	43'71	324	15'76	16'95	290	14'10	15'16	—	—	—	—
Tirhoot - - -	2,883	—	9'81	16'	4,509	15'34	25'1	404	1'37	2'1	2,536	7'22	14'1	—	—	—	—
Punjab, Northern - -	11,583	—	15'65	24'56	9,898	13'37	20'98	2,396	3'24	5'04	5,405	7'30	11'36	—	—	—	—
Rajputana - - -	39,847	3,157	13'53	18'18	54,567	17'17	23'07	9,530	2'99	4'03	21,913	6'89	9'26	—	—	—	—
Holkar's - - -	5,910	—	10'20	15'62	10,285	17'75	27'18	4,022	6'94	10'63	8,281	14'29	21'89	—	—	—	—
Neemuch - - -	—	—	—	—	680	14'54	30'13	27	'58	1'19	385	8'23	17'06	—	—	—	—
Totals for Railways	889,429	141,929	—	—	1,316,749	—	—	467,042	—	—	702,253	—	—	8,301	—	—	8,871
Indus Steam Flotilla	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals for Railways } and Flotilla - }	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

ing Year ended 31st December 1876.

Taxes.		Compensation for Personal Injury, &c., Damage and Loss of Goods.				Legal and Parliamentary Expenses.			Miscellaneous Working Expenditure, not included in the foregoing.			Total Working Expenditure.			Railway.
Mile.	Per cent. of Gross Receipts.	Gross.		Per Train Mile.	Per cent. of Gross Receipts.	Gross.	Per Train Mile.	Per cent. of Gross Receipts.	Gross.	Per Train Mile.	Per cent. of Gross Receipts.	Gross.	Per Train Mile.	Per cent. of Gross Receipts.	
		Personal.	Goods.												
		£	£	d.		£	d.		£	d.		£	s.		GUARANTEED.
18	*16	—	1,109	*04	*04	366	*01	*01	159,399	5*87	5*30	1,924,935	3*14	34*05	East Indian, Main Line.
—	—	—	67	*03	*03	29	*01	*01	24,397	9*89	9*95	120,033	4*06	48*96	East Indian, Jubbul-pore Line.
05	—	—	1,405	*06	—	1,427	*06	—	125,899	5*37	5*5	1,057,565*	3*76	47*	Great Indian Penin-sula.
*07	*11	953	321	*13	*19	552	*06	*03	45,543	4*66	6*98	419,813	3*60	64*38	Madras.
*13	*11	—	513	*10	*03	1,866	*36	*30	46,994	9*21	7*57	340,226	5*55	54*80	Bombay, Baroda, and Central India.
*030	*032	3,648	3,232	1*100	1*165	364	*058	*062	56,072	8*978	9*502	395,549	5*278	67*35	Scinde, Punjab, and Delhi.
0*10	*14	76	—	*03	*04	2	—	*01	12,272	4*73	6*43	101,633	3*26	53*27	South Indian.
*30	*23	—	405	*16	*13	73	*03	*02	25,367	11*05	8*38	140,368	5*33	46*55	Eastern Bengal.
—	—	—	51	*01	*01	415	*09	*12	34,922	7*49	10*23	218,102	3*90	63*94	Oude and Rohilkund.
															STATE.
*35	*63	—	—	—	—	8	*04	*05	1,201	6*83	2*21	10,683	5*06	108*63	Calcutta and South-eastern.
*09	*20	—	—	—	—	—	—	—	956	5*68	12*71	8,358	4*13	111*15	Nulhati.
—	—	—	—	—	—	—	—	—	629	30*41	9*88	4,479	18*03	70*3	Amraoti
—	—	—	—	—	—	—	—	—	284	18*80	9*57	2,143	11*85	72*41	Kamgaun
—	—	—	—	—	—	—	—	—	4,957	7*63	9*30	45,711	5*86	85*72	Nizam's.
—	—	—	—	—	—	—	—	—	257	12*43	13*37	2,275	9*21	118*87	Wurdha Valley.
—	—	—	61	*20	*03	—	—	—	1,927	6*56	10*7	12,320	3*49	67	Tirhoot.
—	—	—	45	*06	*09	—	—	—	6,362	8*60	12*97	35,689	4*02	75	Punjab, Northern.
—	—	—	204	*06	*09	—	—	—	23,102	7*27	9*76	152,320	3*99	64*38	Rajputana.
—	—	—	231	*40	*61	1	*00	*00	6,535	11*27	17*27	35,265	5*07	93*20	Holkar's.
—	—	—	—	—	—	—	—	—	361	7*72	15*99	1,453	2*59	64*38	Neemuch.
—	—	4,677	7,634	—	—	5,103	—	—	577,436	—	—	4,129,424	—	—	Totals for Railways.
—	—	—	—	—	—	—	—	—	—	—	—	97,742	—	69*413	Indus Steam Flotilla.
—	—	—	—	—	—	—	—	—	—	—	—	4,227,166	—	—	{ Totals for Railways and Flotilla.

* Exclusive of 90,207*l.* 1*s.* 5*d.* charged to special funds.

SUMMARY.

96. It now only remains for me briefly to recapitulate the principal facts given in the foregoing pages.

97. There are now open in India 6,937 miles of railway, of which 479 were completed during the year 1876. Of this length, 767 miles are laid with a double line, 5,748 are constructed on the 5 ft. 6 in. gauge, and 1,162 on the metre gauge. The most important additions made within the year are those of the South Indian Railway, between Madras and Tuticorin, and of the Punjab Northern line between Lahore and Jhelum. The works on the Northern Bengal and the Indus Valley have been advanced considerably, and it is expected that portions of these lines will be opened during the present year. The line from Rangoon to Prome is probably by this time open for traffic.

98. The total amount expended on the railways to the 31st March last as regards the Guaranteed lines, and to the 31st December as regards the State lines, was 109,364,867*l.*, of which 94,272,265*l.* consisted of guaranteed capital, and 15,092,602*l.* was raised by the Government for the State lines. During the year 1876 about 3,500,000*l.* was expended on the State, and 879,665*l.* on the Guaranteed lines.

99. The revenue derived from the railways during the year was 4,564,823*l.*, of which 4,451,422*l.* was earned by the Guaranteed Companies. The amount advanced for guaranteed interest to these Companies was 4,634,222*l.*, leaving a difference of 182,800*l.*, but 811,334*l.* of the revenue consisted of surplus profits from certain lines, half of which had consequently to be returned to the Companies.

100. The gross receipts were 8,793,982*l.*, and the working expenses 4,229,156*l.* The receipts from passengers amounted to 2,646,570*l.*, from goods 5,655,238*l.*, and from miscellaneous sources 483,232*l.*

101. Compared with the previous year, the revenue showed an improvement of 916,955*l.*, and instead of having to supply a net sum of 1,073,882*l.* for guaranteed interest, the Government had only to provide 588,467*l.*

102. The number of passengers carried was 30,535,319, with an average mileage open of 6,592 miles compared with 26,779,437 of the previous year, and a mileage of 6,298. The proportion per cent. of the first class was 76, of the second 22.4, and of the lower classes 97. The amount of goods carried was 5,871,690 tons compared with 4,388,660 of 1875. The proportion per cent. of the gross revenue from passengers was 33.84, and from merchandise, including minerals, 66.16.

103. The expenses of maintaining and working the railways were 4,226,966*l.*, being 487,043*l.* more than the previous year, and 49.20 per cent. of the gross receipts. The East Indian Main line came to only 34 per cent., the Eastern Bengal 46.55, the Great Indian Peninsula 47, while the Scinde, Punjab, and Delhi were 67.35, the Madras 64.38, and the Oude and Rohilkund 63.94 per cent.

104. The lines have been well maintained, and the rolling stock and locomotives, to which considerable additions will have to be made, have been kept in good order.

105. A more liberal policy than hitherto is being pursued with regard to the management of the railways, and the traffic has been stimulated in consequence. Passengers are on some lines carried for less than a farthing a mile, and rates as low as a halfpenny per ton per mile have been charged, with good effect, for the carriage of grain, seeds, coal, and other staple products.

106. Concurrent with these measures for increasing traffic, well directed exertions have been made to ensure economical management. These double efforts have produced the satisfactory results just briefly stated, besides those other effects which a good example and a successful issue scarcely ever fail to bring.

107. The following figures, which are extracted from Mr. Rendel's tables, show the relative position of the different lines in respect of the unit of profit :—

AVERAGE Sums received, Cost and Profits per Passenger, and per Ton per Mile.

Railways.	Passengers.		Goods.		Profits.	
	Receipts.	Cost.	Receipts.	Cost.	Each Passenger per Mile.	One Ton of Goods per Mile.
	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>
East Indian (Main)	383	15	895	255	233	640
Jubbulpore Line	413	18	965	41	233	555
Great Indian Peninsula	376	224	1 115	52	152	595
Madras	372	196	1 135	788	176	347
Bombay, Baroda, and Central India	359	252	1 304	575	107	729
Eastern Bengal	376	191	1 185	47	185	715
Oudh and Rohilkund	241	111	881	612	130	269

108. The trade and traffic of the past and present year would seem to show that an important movement has set in, which will greatly improve the commercial relations of India with this country, and tend to the advantage of both. It would hardly have been thought possible twenty years ago that a granary for England would have been found in the valleys of the Ganges, Jumna, and Indus. Notwithstanding their distance from a sea-port, we have seen during the last two years a rapidly increasing production of grain and seeds in the provinces watered by those rivers, and a large export trade springing up. The demand has, no doubt, this year been enhanced by the wants of the famine-stricken districts of Southern India, but the significant fact still remains, that a considerable advance has been made in the export trade. In the year 1871 the exports of wheat and oil seeds were 248,522 cwt. and 3,382,447 cwt. respectively, of which 1,384,023 was sent to England. In 1876 the wheat exported amounted to 5,583,336 cwt., of which 4,337,208 came to this country, and the seeds to 5,614,817 cwt., of which 3,740,362 came to England. Five years ago the aggregate quantities of these articles carried on the different railways then open were 7,460,340 cwt. of grain, and 2,672,640 cwt. of seeds; last year they were 25,640,720 cwt., and 11,862,262 cwt., being a total of 37,502,982 cwt., or 1,875,149 tons. So long as the difference between the price in the English market and the united cost of production, inland transit, and freight, is such as to leave a sufficient margin for a fair profit to the grower and the merchant, Indian wheat will find its way to England, and it seems probable that, with the facilities now afforded, a steady trade will be established. Railways have been very instrumental in promoting this highly desirable movement, and it may be confidently expected that other products of the soil will, with increased advantages of conveyance and diminished cost of transport, find a European market. When the fibres of Russia were denied to us during the Crimean War, India stepped in and supplied us with jute, and has continued to do so, to an increasing extent, ever since. The same may now happen with respect to wheat, barley, &c. Other products will also appear in the market. A country with a soil and climate capable of producing corn, tea, and tobacco, as well as coffee, opium, sugar, indigo, and cotton, must possess powers which, with the assistance of regular and cheap transport, will be ready to meet any demand that may be made upon it.

I have the honour to remain,

My Lord Marquis,

Your Lordship's very obedient humble Servant,

JULAND DANVERS.

LONDON :

Printed by GEORGE E. EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty.
For Her Majesty's Stationery Office.

EAST INDIA (REVENUE AND EXPENDITURE, 1861-2 to 1877-8).

256
585

RETURN to an Address of the Honourable The House of Commons,
dated 11 June 1877;—for,

“COPY of STATEMENT showing the REVENUE and EXPENDITURE in each Year from 1861-2 to 1877-8 (including EXPENDITURE on FAMINE, but excluding that on PUBLIC WORKS EXTRA-ORDINARY, from 1867-8), the SURPLUS or DEFICIT in each Year, and the Net Amount of DEBT incurred from 1861-2 to 1876-7, inclusive.”

India Office,
11 June 1877.}

GEORGE HAMILTON.

STATEMENT showing the REVENUE and EXPENDITURE of INDIA in each Year from 1861-62 to 1877-78 (including EXPENDITURE on FAMINE, but excluding that on PUBLIC WORKS EXTRA-ORDINARY from 1867-68), the SURPLUS or DEFICIT in each Year, and the Net Amount of DEBT incurred from 1861-62 to 1876-77, inclusive.

Y E A R.	REVENUE.	ORDINARY EXPENDITURE.			SURPLUS.	DEFICIT.
		Excluding Famine.	Famine.	TOTAL.		
	£.	£.	£.	£.	£.	£.
1861-62 - - - -	43,829,472	43,880,100	- -	43,880,100	- -	50,628
1862-63 - - - -	45,143,752	43,316,406	- -	43,316,406	1,827,346	—
1863-64 - - - -	44,613,032	44,534,685	- -	44,534,685	78,347	—
1864-65 - - - -	45,652,897	45,846,418	- -	45,846,418	- -	193,521
1865-66 - - - -	48,935,220	46,169,152	- -	46,169,152	2,766,068	—
1866-67 (11 months) - -	42,122,433	44,639,924	- -	44,639,924	- -	2,517,491
1867-68 - - - -	48,534,412	49,542,107	- -	49,542,107	- -	1,007,695
1868-69 - - - -	49,262,691	52,036,721	- -	52,036,721	- -	2,774,030
1869-70 - - - -	50,901,081	50,782,412	- -	50,782,412	118,669	—
1870-71 - - - -	51,413,686	49,930,696	- -	49,930,696	1,482,990	—
1871-72 - - - -	50,110,215	46,986,038	- -	46,986,038	3,124,177	—
1872-73 - - - -	50,219,489	48,453,817	- -	48,453,817	1,765,672	—
1873-74 - - - -	49,598,253	47,541,248	3,864,673	51,405,921	- -	1,807,668
1874-75 - - - -	50,570,171	48,013,114	2,237,860	50,250,974	319,197	—
1875-76 - - - -	51,310,063	49,132,564	508,554	49,641,118	1,668,945	—
1876-77 - - - - (Register Estimate.)	51,220,713	51,167,367	*1,911,504	53,078,871	- -	1,858,158
1877-78 - - - - (Budget Estimate.)	52,192,700	51,589,400	*1,425,000	53,014,400	—	—
NET SURPLUS between 1861-62 and 1876-77 - - - } £.					13,151,411	10,209,191
					10,209,191	—
					2,942,220	—

* In addition to the Sums charged for Famine Relief as “Direct Outlay,” viz. - - -
The Government of India estimate the Loss of Land Revenue at - - -
Ditto - - - ditto - - - Excise - - -
Ditto - - - ditto - - - Forest - - -
Ditto - - - ditto - - - Excess Charges in the Army - - -

Deduct,—
Estimated Gain to the Revenues from increased earnings of Guaranteed and State
Railways due to the Famine - - - - -

	1876-77.	1877-78.
£.	£.	£.
1,911,504	1,425,000	
1,384,500	495,100	
92,500	33,300	
20,000	—	
80,000	103,700	
TOTAL - - - £.	3,488,504	2,057,100
290,000	5,100	
£.	3,198,504	2,052,000

TOTAL ESTIMATED NET COST OF FAMINE - - - £. 5,250,504.

NET AMOUNT of DEBT incurred from 1861-62 to 1876-77 inclusive - - - - - £.
Of which on account of redemption of Dividend on East India Company's Capital Stock - - - - - 32,666,828
4,579,416
£. 28,087,412

EAST INDIA
(REVENUE AND EXPENDITURE,
1861-2 TO 1877-8).

STATEMENT showing the REVENUE and EXPENDITURE of INDIA in each Year from 1861-62 to 1877-78 (including EXPENDITURE on FAMINE, but excluding that on PUBLIC WORKS EXTRAORDINARY from 1867-68), the SURPLUS or DEFICIT in each Year, and the Net Amount of Debt incurred from 1861-62 to 1876-77, inclusive.

(*Lord George Hamilton.*)

*Ordered, by The House of Commons, to be Printed,
11 June 1877.*

RETURN to an Address of the Honourable The House of Commons,
dated 22 March 1877;—for,

“COPY or EXTRACTS of PAPERS received from the Government of *India*,
and from Her Majesty’s Representatives and Consuls in Foreign
Countries, having reference to the SILVER QUESTION (in continuation
of Papers laid before the Select Committee on the Depreciation of Silver).”

India Office, }
22 March 1877. }

GEORGE HAMILTON,
Under Secretary of State.

(*Lord George Hamilton.*)

Ordered, by The House of Commons, to be Printed,
22 March 1877.

TABLE OF CONTENTS.

	PAGE		PAGE
Summary - - - - -	3	Sweden - - - - -	81
India - - - - -	14	Norway - - - - -	83
Latin Union - - - - -	26	Portugal - - - - -	84
France - - - - -	27	Russia - - - - -	87
Algeria - - - - -	45	United States - - - - -	91
Belgium - - - - -	46	Central America - - - - -	110
Switzerland - - - - -	47	Venezuela - - - - -	110
Italy - - - - -	48	Brazil - - - - -	112
Greece - - - - -	52	Peru - - - - -	116
Netherlands - - - - -	56	Chile - - - - -	117
Germany - - - - -	75	Argentine Republic - - - - -	122
Denmark - - - - -	81	Japan - - - - -	124

COPY or EXTRACTS of PAPERS received from the Government of *India*, and from Her Majesty's Representatives and Consuls in Foreign Countries, having reference to the SILVER QUESTION (in continuation of Papers* laid before the Select Committee on the Depreciation of Silver). *C. 338 of 1876.

SUMMARY.

SUMMARY.

ON the 28th of August 1876 the Secretary of State for Foreign Affairs was requested to obtain from Her Majesty's Representatives and Consuls in foreign countries all the information which it might be in their power to get with regard to the production and distribution of silver, the exports and imports of that metal, coinage, legislation respecting currency, and other particulars bearing on the question of the Depreciation of Silver. An account was particularly requested of the position of affairs towards the end of the year, so as to admit of the documents being prepared for presentation to Parliament on its re-assembling.

Instructions were accordingly sent from the Foreign Office on the 2nd of September.

On the 31st of October a despatch was addressed to the Government of India, asking for a succinct note regarding the effect which the fall in the price of silver might have had on trade or remittances, and on prices in India, as well as a narrative of any applications made with a view of supplying a remedy for the existing state of things, and of the action of the Government thereon.

On the 2nd of February the Viceroy mentioned, in a telegram, that prices in India showed no fall in the value of silver, and that trade showed a slightly accelerated growth of exports, but a cessation of the growth of imports. A week afterwards the Government of India forwarded a note containing all the particulars they could at present supply on the subject; the Chambers of Commerce had also been invited to give information, and tables were being prepared, showing the variations, in all parts of India, of the retail prices of grain and of agricultural wages, for a series of years.

INDIA.

Letter from India,
9 February 1877
(No. 49, Financial).
Page 14.

The following figures are given regarding the foreign trade of India, exclusive of treasure :—

	OFFICIAL YEAR.		
	1873-74.	1874-75.	1875-76.
	Value in £. Millions Sterling.		
Exports - - - - -	54.96	56.31	58.04
Imports - - - - -	31.64	34.64	37.07
NET EXPORTS - - -	23.32	21.67	20.97

SUMMARY.

But, taking the eight months from April to November, the figures would be :—

	1873.	1874.	1875.	1876.
Exports - - - -	32·28	34·09	35·90	37·93
Imports - - - -	20·11	22·23	22·64	22·52
NET EXPORTS - - -	12·17	11·86	13·26	15·41

These figures are said to show a slightly accelerated growth of the export trade, and an interruption of the growth of the import trade, the result being a considerable increase in the value of the net exports. Important alterations of the tariff values and customs duties were made in 1875, and it is difficult to discriminate their effect on trade; but the interruption of the growth of the import trade is attributed mainly to the depreciation of silver relatively to gold. The silver prices of imported goods in India have not risen, but, on the whole, the import trade has not latterly been unprofitable, and the value of cotton manufactures imported does not decrease. The increase of exports is the more remarkable as being contemporaneous with the falling-off in those of raw cotton; the export trade of the past year is stated to have been very profitable to all concerned, including producers.

Exports of gold exceeded the imports, for the first time, during the current year 1876-77; this unusual phenomenon continued from June to October, and is attributed to the fact of the relative values of gold and silver not having varied in India in the same proportion as elsewhere.

The alarm as to the future value of silver led banks and others to make great efforts to withdraw their capital, a movement which partly explains the extreme depression in June and July. The retransmission of capital to the East, on the partial restoration of confidence, may explain the rapidity of the subsequent recovery in the value of silver and of the exchange with gold.

Tables are given of the prices of the chief staple commodities at Bombay and Calcutta since January 1873; excepting spelter and gold, the prices of imports are generally lower than at that date, and there has been no marked rise in the prices of imported commodities since the beginning of 1876. Among exports the chief articles which have risen in price since January 1873 are jute, rice, silk, tea, and coffee, and since January 1876 indigo, rice, silk, tea and wheat. On the other hand, cotton, wool, hides, lac, saltpetre, and wheat show a decrease as compared with 1873, but all, except cotton and hides, have materially recovered in 1877. There are special causes for the improvement of prices in most cases, and, on the whole, the tables do not indicate any decrease in the value of silver, though the prices of all articles of export have doubtless been stimulated by the low rate of exchange.

In July 1876 the Chamber of Commerce at Calcutta addressed the Government of India in favour of the suspension of silver coinage, a discretionary power being reserved by the Government to issue what might be necessary; and on the 1st of August a similar memorial was received from the Calcutta Trades Association. On the 22nd of September the Government of India replied to these memorials, in a resolution expressing an opinion that the recent change in the value of silver, measured in gold, was due rather to an increase in the value of gold as compared with other commodities, than to a decrease in that of silver. The large imports of treasure into India since 1850 were due to the transfer of large demands for produce caused by the Crimean and American wars, and the loans for the suppression of the mutiny, the construction of railroads and canals, and the relief of the famine in Bengal. It would be an error to suppose that these abnormal imports of treasure continue; and there was, therefore, no reason to expect that silver would be poured into India, though, if it fell in value, a greater weight must come to represent the same value. To suspend the coinage would give a monopoly value to the existing stock of rupees, and so reduce prices, whereas prices had not yet risen. Silver would no longer be the standard of value in India. For these and other reasons, the Government declined to suspend the free coinage of silver without at the same time

time opening the mints for the free coinage of gold. There was, however, nothing as yet demanding so costly and uncertain a measure as the adoption of a gold standard, and, up to that time, they held that there was no sufficient ground for interfering with the standard of value.

SUMMARY.

Letters have been received through the Foreign Office, relating to the currency in the following States :—

Answers sent
through the
Foreign Office.

EUROPE :

Belgium.
Denmark.
France (including Algeria).
Germany.
Greece.
Italy.
Netherlands.
Portugal.
Russia.
Sweden and Norway.
Switzerland.

ASIA :

Japan.

AMERICA :

United States.
Central America.
Brazil.
Peru.
Chile.
Argentine Republic.

LATIN UNION.

Page 26.
Page 27.

A copy has been received of the Declaration of the Latin Union of the 3rd of February 1876, and also the Report made to the Swiss Federal Council by the Delegates sent to the Monetary Conference of that Union, held in January and February 1876. The coinage of 5-franc pieces by Belgium, France, and Italy, in 1875, is shown to have been (as stated at page xxxix of the Select Committee's Report) up to the full extent permitted, while Switzerland refrained from issuing any. Italy also put into circulation the 800,000 *l.* (twenty millions of francs in 5-franc pieces) previously held as a reserve by the National Bank (pages xxxix and xlii of Report). Coinage of gold pieces of 20 francs has also taken place in 1875 to the following extent :—

	<i>Francs.</i>	<i>£.</i>
Belgium - - - - -	82,685,000	3,307,400
Italy - - - - -	2,244,440	89,778
France - - - - -	234,912,000	9,396,480
TOTAL - - -	319,841,440	12,793,658

or more than three times the gold coinage of 1874.

Notwithstanding the arguments urged by the Swiss delegates in favour of a gold standard, it was determined to allow, for 1876, coinage of silver to the following extent :—

	<i>Francs.</i>	<i>£.</i>
Belgium - - - - -	10,800,000	432,000
France - - - - -	54,000,000	2,160,000
Italy - - - - -	36,000,000	1,440,000
Switzerland - - - - -	7,200,000	288,000
Greece - - - - -	3,600,000	144,000
	111,600,000	4,464,000
Greece (special allotment) - - - - -	8,400,000	336,000
TOTAL - - -	120,000,000	4,800,000

The Swiss delegates also wished to reduce the power of issuing Mint certificates, but the Conference would not agree to the proposal.

A curious account is given of the operations of a gang of coiners in Spain.

The question of adopting a gold standard was to form the subject of discussion at the meeting of the Conference which it was then intended to hold in January 1877.

SUMMARY.

FRANCE.

Lord Lyons, on the 4th of September 1876, reported that the Bill introduced by the French Minister of Finance to limit or suspend the manufacture of silver 5-franc pieces till the 31st of January 1878 (as mentioned at page xxxix of the Report of the Select Committee of the House of Commons), was passed and promulgated, and that the Government had actually suspended by decree the coining of such pieces on private account at the Mints of Paris and Bordeaux.

On the 13th of December notice was given in the "Journal Officiel," that a number of foreign silver pieces, coming from South America, were in circulation in France, but that they had no legal currency, the only foreign silver coins accepted at the public treasuries and the bank being those of Belgium, Greece, Italy, and Switzerland.

On the 19th of January 1877, Lord Lyons forwarded various returns, obtained from the Director of the Mint at Paris, concerning the amount of precious metals used in manufacture, their movement, coinage, &c. &c., in 1876. He also sent reports by the Consuls at Cherbourg, Marseilles, and Bordeaux, on points falling under their observation respecting the silver question.

On the 22nd of January Lord Lyons reported that the Monetary Conference, which was to have been held in that month, had been postponed to the end of the year, the several Powers forming the Latin Union agreeing in the meantime to maintain the existing stipulations respecting the coinage of silver, which, as M. Léon Say explained in a letter forwarded by Lord Lyons on the 13th of February, restricted the contingent for each nation in 1877 to half the amount allowed in 1876. They cannot, therefore, coin greater sums this year than the following:—

	Francs.
France - - - - -	27,000,000
Belgium - - - - -	5,400,000
Italy - - - - -	18,000,000
Switzerland - - - - -	3,600,000
Greece - - - - -	1,800,000
TOTAL - - - - -	55,800,000

See "Journal Officiel," 4 March 1877.

On the 5th of February M. Garnier presented to the Senate a proposition for replacing the existing coinage by uniform pieces with more national inscriptions without changing their composition or intrinsic value, and for suppressing the fixed relation between gold and silver, treating the two metals as articles of merchandise. The proposal involves the termination of the Latin Union, and the issue of a new gold coinage.

ALGERIA.

Colonel Playfair, on the 20th of October 1876, reported, with regard to the hoarding of silver in Algeria, that the war indemnity of 1871 was largely paid in old uncurrent silver coin, but that now gold is used in preference for hoarding, and that ornaments of base metal are taking the place of those of silver.

BELGIUM.

On the 2nd of December Mr. Lumley reported the introduction, and on the 7th the adoption, of a Bill providing that from the 1st of January 1877 no more pieces of five francs shall be coined in silver in Belgium. M. Malou explained that this was only intended as a temporary measure, and not to facilitate the introduction of a single gold standard, a change which could not be adopted before 1880 by any member of the Latin Union separately.

SWITZERLAND.

Mr. Corbett, on the 20th of November 1876, wrote that Switzerland was coining neither gold nor 5-franc pieces, depending on France and Italy for currency of that description; that silver was one-eighth per cent. below what was considered its par value as compared with gold; and that the banks, though not unprovided with gold, were averse to paying it, so as to increase the exportation of coin from Switzerland.

Mr.

Mr. Compton, Third Secretary to the British Embassy at Rome, in a report dated the 20th of December 1876, mentioned that accurate statistics regarding the silver question are not to be obtained in Italy, and that the French reports on the exports and imports of the two countries were more to be trusted. Since the issue of the paper currency, in 1866, nearly 30,000,000 *l.* worth of silver has been exported from Italy, and little remains except in the treasury and banks. A table is given, showing the amount of coinage in Italy from 1862 to October 1876.

SUMMARY.

ITALY.
Page 48.

In 1862 the ancient money coined in conformity with the decimal system and therefore not subject to conversion, amounted to 232,500,000 *lire* in gold, and 79,500,000 *lire* in 5-franc pieces; to which were added, in 1870, about 6,000,000 *lire* of gold and 500,000 *lire* in 5-franc pieces, coined by the Pontifical Government since 1860, and not subject to conversion. The value of the old coin withdrawn to the end of 1875 was 486,500,000 *lire* of silver or *erosomiste*, 28,500,000 *lire* of gold, and 28,500,000 *lire* of copper. The money issued in conformity with the decimal system (including that above mentioned as not converted, and that coined from 1862 to 1875) amounts to 474,500,000 *lire* in gold, 361,000,000 *lire* in silver 5-franc pieces, 156,000,000 *lire* in smaller silver money, and 76,000,000 *lire* in copper. There can, however, be no doubt that the greater part has been melted again, or been sent out of the country, and what remains in the hands of private persons is too small to affect the question. The total in the Treasury and banks now is about 184,500,000 *lire*, equally divided between gold and silver, besides 3,500,000 *lire* in copper; the stock of silver being therefore worth rather more than 3,500,000 *l.*

The aggregate coinage in the Latin Union States (from 1795 in France, from 1862 in Italy, from 1832 in Belgium, and from 1850 in Switzerland), added to the ancient coins of Italy which have not been demolished, is stated to have amounted to 8,841,000,000 *lire* in gold, and 5,847,000,000 *lire* in silver.

Mr. Compton proceeds to show that, while it will be the interest of Italy to support the adoption of the single gold standard in the Latin Union, she will, notwithstanding the risk from counterfeit coin, oppose the introduction of such a standard until she is prepared to redeem her forced paper currency.

Mr. Barff, acting Consul at Naples, stated that the silver coinage current in Southern Italy is limited to Sicilian dollars and the Latin Union coins. The former are only used to pay custom-house import duties, after which they are sold by the authorities, and re-purchased to pay such duties again. The latter are used principally in small payments, as a substitute for gold. There is very little current silver coin. Page 52.

Mr. Stuart enclosed, on the 6th of December 1876, a report by Mr. Merlin, Her Majesty's Consul at the Piræus, and General Manager of the Ionian Bank, on the silver currency of Greece. Mr. Merlin stated that hardly any silver is produced in Greece; that the coinage from 1833 to 1862 only amounted to about 4,000 *l.* in gold, and 36,000 *l.* in silver; and that till the 1st of August 1876 the silver currency consisted almost entirely of Mexican and German dollars, with *zwanzigers* for small coin, but that the total amount in circulation probably never exceeded 214,286 *l.*, the real currency being the banknotes. Greece joined the Latin Union in 1868, and obtained permission to strike one million 5-franc pieces; but the assimilation of the currency to the French standard was deferred, till the fall in the price of silver in 1875 rendered further measures necessary. The Government tariff for silver money, except that of the Latin Union nations, was lowered 3 per cent., which prevented any larger importation of German or Mexican dollars for the time. They also obtained permission to strike a further amount of 5-franc pieces, so as to form a total silver currency in that coin of 17,000,000 francs, besides 9,000,000 francs in smaller silver coin, the amount of gold coinage being without restriction. On the 10th of April 1876 an ordinance was published (*see* page 119 of Appendix to Select Committee's Report), decreeing that, after the 13th of August, no silver coins but those of the Latin Union should be received at the public treasuries and custom-houses, and that, till that date, a duty of 10 per cent. should be levied on the importation of any other silver coins. The banks had to send their spiece at their own expense to Paris for re-coinage, and on the 13th of August 1876 they began to pay in the new currency. The amount so coined had, up to the

GREECE.
Page 52.

SUMMARY. 28th of November, been 984,020 francs in gold, and 23,045,000 francs in silver.

NETHERLANDS. Sir Edward Harris, on the 17th of October, forwarded a memorandum by the Minister of Finance at the Hague, describing the steps taken by the Netherlands Government since 1872 in regard to a monetary standard. The Law of the 6th of June 1875, restricting the coinage of silver and authorising that of gold, but not changing the existing silver standard, was mentioned at page xi of the Select Committee's Report. In May and June 1876, Bills were presented to the Second Chamber of the States-General, for the adoption of a gold standard in the Netherlands, and of a double standard in the East Indian possessions, with the suspension of silver coinage. Returns were forwarded by Sir Edward Harris, showing the imports and exports of gold and silver into and from Holland from 1870 to 1875, the amount of coin and bullion held by the Bank of the Netherlands from May 1875 to May 1876, the gold coinage since the 1st of July 1875, and the silver coinage since 1840.

Page 64. In later letters Sir Edward Harris and Mr. Fenton (the Secretary of Legation) reported that the Bill for regulating the monetary system of the Netherlands had been materially altered, by the omission of the paragraph declaring gold to be the standard, and the adoption of one declaring both gold and silver standard money : thus amended, it passed the Second Chamber, but was rejected by the First Chamber. Thereupon a Bill was passed prolonging the Law of 1875 to the 31st of December 1877, the Government intimating that they would before that date make a fresh attempt to legislate for the permanent settlement of the question.

Page 73. The Bill for the regulation of the monetary system of the Dutch East Indian possessions was withdrawn, and has been reintroduced with certain necessary verbal alterations. Its principal feature is the establishment in the Dutch East Indies of the double instead of the existing silver standard. A translation of the Bill was forwarded by Mr. Fenton on the 10th of February.*

Page 74. On the 12th he reported that a Bill had been introduced containing those clauses of the Bill withdrawn in December which related to the substitution in the Netherlands of a bronze coinage in place of the existing copper coinage, and forbidding the circulation within the country of foreign coins of copper, bronze, or nickel.*

Page 75. By a statement published in the Official Gazette, it appears that the coinage in 1876 amounted to the value of 1,338,469 *l.*, and consisted of 1,581,106 gold 10-florin coins and 44,408 gold ducats, on private account; and, on Government account, of 1,000,000 silver coins of 10 cents, and 200,000 of 5 cents, and 13,047,000 copper coins of 1 cent, and 2,020,000 of $\frac{1}{2}$ cent.

GERMANY. On the 30th of October 1876, Lord Odo Russell forwarded a translation of an interesting article, in a Hamburg newspaper, on the subject of the amount of silver remaining for disposal in Germany. He also mentioned a rumoured proposal to increase the amount of subsidiary coinage to 15 marks per head; but on the 1st of November he reported that so strong a feeling had been shown in the Reichsrath against the measure, that the Imperial Government had decided not to bring it forward; and consequently the 250 millions of marks, which would thereby have been absorbed, would be eventually thrown upon the market.

Page 78. On the 15th of November Lord Odo Russell transmitted a note, by Her Majesty's Consul at Bremen, on the stock of silver still remaining to be sold by the Government, which he estimated at 20,122,965 *l.* in the beginning of June 1876.

Page 80. Mr. Petre at Stuttgart, and Mr. Jerningham at Darmstadt, stated that the local governments of Wurtemberg, Hesse, and Baden had ceased individually to have any influence on the currency question.

DENMARK. Sir Charles Wyke wrote, on the 10th of October, that, in accordance with the provisions of the Mint Act of 23rd May 1873, the old silver currency ceased on

* These two Bills were passed on the 27th of March.—H. W.

on the 1st of October 1876 to be legal tender, the relative value of gold to silver being taken in the conversion at 15'675 to 1. The silver withdrawn from circulation has been sent to England.

SUMMARY.

Mr. Erskine, on the 3rd of November, forwarded a report by Consul Segrave, on the production and distribution of silver in Sweden. Subsidiary silver coin to the value of 497,467 *l.* has been produced since March 1874. SWEDEN.
Page 81.

On the 11th of January 1877, he wrote a further note regarding the price of silver, showing that, after the change of standard in 1873, the Riksbank was compelled to dispose of its superfluous stock of silver, at whatever price could be obtained—part being sold in 1874-75 at about 59 *d.* per oz., and part in 1876 at 53 *d.* or 54 *d.* Page 82.

Mr. Jones, the Consul General at Christiania, reported on the change of standard in Norway in 1873, under exceptionally favourable circumstances. Silver to the value of about 1,450,000 *l.* has been disposed of, chiefly in London, since December 1872. The production from the mines is about 5,200 kilogrammes (or a little more than 167,000 ozs.) annually. NORWAY.
Page 83.

Mr. Crawford, Her Majesty's Consul at Oporto, on the 28th of December 1876, forwarded a report on the Currency of Portugal, where the standard is gold, English sovereigns and half-sovereigns being legal tender, and silver coins can only be used for payments not exceeding 5,000 reis, or about 22 *s.* 3 *d.* He also explained the measures taken by the Government in the summer of 1876, in consequence of the commercial panic arising from a scarcity of gold coin. A table at the end of the report shows that the average rate of exchange during each month of the year 1876, for bills at six months upon London, was never lower than 53 or higher than 54 pence per 1,000 reis. PORTUGAL.
Page 84.

Mr. Webster, Vice Consul at Kherson, on the 30th of September sent a report on the Currency of Russia. The amount of silver now in circulation is estimated at 150,000,000 roubles, or 20,000,000 *l.* (taking the rouble at 2 *s.* 8 *d.*). The yield of the Siberian mines is 550,000 ozs. of silver annually, of which one-third is coined, and the rest used in manufactures. The imports of silver are counterbalanced by exports from Siberia to China. The net export of gold and silver from Russia was in 1874 447,231 *l.*, in 1875 1,471,416 *l.*, and in 1876 to the 21st of December 10,319,450 *l.* Mr. Webster considers the value of the silver roubles, relatively to gold, to have diminished by one-sixth since 1856; but there is no demand for them, the legal tender being the "paper silver rouble," the notes of which currency were in circulation to the 7th of August to the value of 729,908,498 roubles, of which 562,796,365 roubles, or 73,568,152 *l.*, were uncovered by bullion. RUSSIA.
Page 87.

Mr. Doria, Secretary of Embassy at St. Petersburg, on the 12th of December, gave statistics for the years 1871 to 1875, from which the following results are deduced (taking the rouble at 2 *s.* 8 *d.*, not 2 *s.* 6 *d.*, as he converts it): Page 89.

	£.
Production of silver in Russia, 1871-75 - - - - -	514,815
Annual average - - - - -	102,963
Coinage of silver, 1871-75 - - - - -	2,013,769
Annual average - - - - -	402,754
Surplus of imports over exports of silver, 1871-75 -	4,737,113
Excess of net imports over amount absorbed in coinage, 1871-75 - - - - -	2,723,343

He added that a very considerable quantity is absorbed in manufactures.

Mr. Barrow, Consul at Kertch, on the 10th of October reported the utter absence of all coins in that part of Russia, except small pieces of 20, 15, and 10 kopecks. The report from Mr. Carruthers, at Taganrog, is to the same effect. Page 90.
Page 91.

Mr. Plunkett, the First Secretary of the British Legation at Washington, on the 17th of December 1876, submitted a report of further information respecting the production and movement of silver in the United States. Dr. Linderman's report on the operations of the mints during the year ending on the 30th of June 1876 gave as the domestic production of silver during the year 38,500,000 dollars, or 7,700,000 *l.*, being 300,000 *l.* less than his previous estimate. UNITED STATES.
Page 91.

SUMMARY.

The stock of silver coin and bullion on hand on the 30th of June was 6,022,600 *l.*, or 3,622,600 *l.* more than the corresponding return for the previous year. Dr. Linderman reduced by one half his estimate of the amount annually consumed in manufactures, which he now puts at 600,000 *l.* The exports of silver in 1875-76 amounted to 5,065,850 *l.*, and the imports to 1,588,549 *l.*, giving a net export of 3,477,301 *l.*, which is 112,146 *l.* less than that of the year 1874-75. The report refers to the large exportation of silver from San Francisco to China and Japan, owing to an increased trade with China in tea and silk, to remittances direct to China on British account, and to the necessity for economy, in consequence of the fall in the value of silver in London; it was, however, supposed that this excessive export had been checked by the higher rates for silver now prevailing at Hong Kong. Most of the silver so sent had been for British merchants, who thus settled accounts with their creditors in China by direct shipments of silver from San Francisco, thereby saving from 1 to 2½ per cent. on the transaction. Mr. Seward, the American Minister at Peking, speaks of the great difficulty of introducing the trade dollar into Northern and Central China, while in Southern China it has not displaced the Mexican dollar, or come into general circulation.

Of the estimated total production of 7,700,000 *l.* in 1875-76, Nevada is expected by Dr. Linderman to yield 4,592,500 *l.* in silver (besides about 3,750,000 *l.* in gold). The silver production of Nevada in 1876-77 was at one time estimated at 5,600,000 *l.*; but Consul Booker thinks that, unless new discoveries are made, there will be a reduction, as two or three of the largest mines have been rapidly diminishing their product. A calculation made at San Francisco by a correspondent of "The Times," gave the total production of silver in the United States for 1876 as not more than 5,600,000 *l.*; but Mr. Plunkett thinks this can scarcely be reconciled with Dr. Linderman's official report, giving over 6,000,000 *l.* as the production in 1875-76.

Silver coinage to the value of 3,825,300 *l.* was struck in 1875-76, of which amount 1,226,410 *l.* was in trade dollars. From the 17th of April to the 30th October 1876, 4,419,342 *l.* of silver coin was issued, of which 2,590,625 *l.* was for the redemption of fractional currency. Silver coin has also been issued under the Act of the 22nd of July last, in exchange for legal-tender notes, as rapidly as the coinage will permit. The Secretary of the Treasury has recommended that such coin should be struck to the extent of 80,000,000 dollars, or 16,000,000 *l.*, and be made legal tender up to 10 instead of 5 dollars. Both he and Dr. Linderman urge the adoption of gold as the sole standard; but the latter would have the trade dollar made legal tender up to 50 or 100 dollars.

A Bill has been passed by the House of Representatives, authorising the coining of the silver dollar of 412½ grains standard, to be legal tender for all debts except where payment of gold coin is required by law. It is not expected that the Senate will consider the Bill till the report is received from the Special Committee which has for some months been investigating the silver question.

On the 27th of February 1877, Sir Edward Thornton forwarded a further memorandum by Mr. Plunkett, and said that it was not likely that the reports of the Joint Committee of Congress on the Silver Question would be published for some time.

Mr. Plunkett's note stated that nothing had yet been done in the Senate with regard to the Bill for the remonetisation of silver. It is understood that the Committee will present two reports—the one by the majority, recommending the remonetisation of silver, and the adoption of the double standard; the other, signed by Mr. Boutwell (who was Secretary of the Treasury from 1869 to 1873), urging the maintenance of a single gold standard, so long as Great Britain and other Powers refuse to abandon it. Mr. Boutwell thinks it inexpedient to coin a silver dollar as legal tender for all purposes except such as are otherwise specially provided for by law or contract; but he would propose a convention of the commercial nations of the world, to consider the adoption of both silver and gold at a fixed relative value, and, in the meantime, he will pursue the existing policy with regard to the resumption of specie payments.

Among the schemes laid before the Committee was one to facilitate the ratio of 1 to 15½ between gold and silver, by issuing a debased silver dollar, worth exactly two of the present half-dollars issued for fractional currency; while another plan, with the same object, was to raise the weight of the gold dollar to 26.61 grains $\frac{1}{16}$ ths fine, retaining the present silver dollar of 412½ grains.

The

SUMMARY.

The early resumption of specie payments is almost universally desired. In his message to Congress on the 3rd of February the President recommended that advantage should be taken of the present state of trade, showing a large excess of exports, to issue 4 per cent. bonds, with 40 years to run, to be exchanged for legal-tender notes whenever presented in sums of 50 dollars, or any multiple thereof, the whole amount not to exceed 150,000,000 dollars. He also recommended the repeal of the Joint Resolution of 22nd July 1876, limiting the amount of subsidiary silver coin to 50,000,000 dollars; this proposal would require an accumulation of only half the amount of coin which, under the Act of 1875, the Secretary of the Treasury may be called upon to have in hand for the redemption of "greenbacks" on and after the 1st of January 1879.

Mr. Morrill, the Secretary of the Treasury, in his annual report to Congress, urged the very serious inconveniences arising from the obligation to collect such a large amount of coin, and suggested that, if specie payments were resumed at once, half the amount would meet all probable demands for specie.

It has also been pointed out that it is in the power of the Government, without fresh legislation, to sell, under the Act of 1875, any amount of $4\frac{1}{2}$ per cent. bonds, at not less than par in coin, which may be necessary for redeeming the "greenbacks."

M. Cernuschi gave evidence to the Committee in explanation of his plan for enabling the Government to resume payments, in gold and silver, on the 1st of January 1878. He proposed the opening of a loan of 85,000,000 *l.* in Europe, at 4 per cent., in order to obtain metal to supply the place of the greenbacks, the coinage of the old silver dollar of 412 $\frac{1}{4}$ grains, and the raising of the weight of the gold dollar to 26.61 grains. From 1st January 1878 all existing debts would be payable in either coin; the interest on the proposed loan would be payable half-yearly, in London, and in sterling, as, if payable in silver, the bonds would be refused in Europe. M. Cernuschi expects, by drawing a vast sum of gold to America, to force European nations to re-adopt the bimetallic standard, and thus bring silver into use again: his proposals, however, have so far met with little or no approval.

An estimate by Messrs. Wells, Fargo, & Co., of the production in the States and Territories west of the Missouri, gives for the calendar year 1876 41,506,672 dollars of silver, and 44,328,501 dollars of gold, as compared with 34,043,910 dollars of silver, and 41,745,147 dollars of gold, in 1875. Dr. Linderman's estimate of the production of silver in the United States, for the year ended 30 June 1876, was 38,500,000 dollars. Both in California and in Washington it is expected that there will be a falling-off in the production, unless new veins are discovered, and it is considered very improbable that the production for this year will reach 40 millions of dollars. Page 107.

Sir Henry Scholfield, Consul at Guatemala, reported, on the 21st of October 1876, that the production of silver in Central America is insignificant. The currency is silver, and the depreciation has been very sensibly felt in the rise of prices of all articles coming from or going to countries where the standard is gold. CENTRAL AMERICA.
Page 110.

Mr. Middleton, Consul General at Caracas, on the 16th of November forwarded a report on the amount of silver and gold coin received from Paris for the Government of Venezuela. Gold pieces are employed for the more important payments, and there is a great scarcity of Venezuelan silver pieces for the smaller requirements, owing to which there is still a large number of foreign coins in circulation. Further importation of foreign silver coin has been prohibited. The value of German thalers having been reduced by a decree from 8 to $7\frac{1}{2}$ reals, they are being largely exported to Europe, as is also the case with gold pieces of 20 marks, for a similar reason. Arrangements have been made with a foreign firm for a further supply of silver coin; and nickel money is to be coined in the United States for the Venezuelan Government. VENEZUELA.
Page 110.

There is scarcely any production of silver in the country.

Mr. Buckley Mathew, on the 8th of November, forwarded a memorandum by Mr. O'Connor on the monetary system of Brazil, which he described as consisting of an inconvertible forced paper currency, supplemented by a gold, silver, nickel, and copper coinage. A sovereign being legal tender for 8,890 reis, the milrei should equal 27 *d.*, but during the last 20 years it has ranged from 14 *d.* to 30 *d.* BRAZIL.
Page 112.

SUMMARY.

The amount of inconvertible paper currency in circulation, converted at the then existing rate of exchange of 24 *d.* to the milrei, is 18,186,870 *l.* The amount of gold and silver coin in circulation is very small, but, if a suggestion that silver should be substituted for the small paper notes of one milrei and 500 reis were adopted, as might be the case if its value continued to fall, Brazil would absorb a good deal of silver. The population is estimated at 11,000,000, and the currency at about 19,000,000 *l.*; the nickel and copper coinage amounts to about 500,000 *l.*, and with the paper money constitutes the currency, for all practical purposes.

Tables were forwarded of the coinage of gold and silver at the Mint of Rio de Janeiro from 1855-56 to 1874-75, of the imports of gold and silver from 1871-72 to 1875-76, and of the exports of gold from 1869-70 to 1875-76.

Page 115.

Mr. Walker, Consul at Pernambuco, reported, on the 18th of October, that there was no silver currency in that province.

Page 115.

In a letter from Mr. Austin, dated at Rio de Janeiro on the 23rd of December, it is said that there is no production, importation, or exportation of silver in Brazil. The little silver that was current was all exported to the River Plate in 1868, during the war with Paraguay, and its place is represented by notes of the nominal value of one and two shillings.

PERU.

Page 116.

Mr. Graham, writing from Lima on the 27th of November, stated that there are 15,000 mines in Peru, of which only about 600 are worked. Silver is the standard, gold having been demonetised in 1872. The circulation of the four associated banks, the notes of which are a legal tender for all payments, amounted on the 15th of November, at the exchange of 4 *s.* for the sole, to 2,619,764 *l.*, against which 12,400 *l.* was held in gold, and 364,004 *l.* in silver. The export of silver coin is prohibited, but it is sent abroad in bars in considerable quantities. Silver ore is very largely produced and exported. Silver soles are at 56 per cent. premium, and only held by a few dealers. The Lima Mint, between 1868 and 1875, coined 17,053,389 silver soles. Foreign coins are imported, chiefly from Bolivia and Chile.

Silver is to be found in all parts of the western range of the Andes, between latitudes 3° and 22° south. The district of Cerro de Pasco produced, from 1630 to 1849, 475 millions of dollars. A proposal has been made for running a tunnel under the present workings, from which it is supposed that sulphurets of silver or bronzes to the value of 500 millions of dollars would be obtained. With railroads and improved machinery, Peru will, in a few years, produce immense quantities of silver.

CHILE.

Page 117.

Mr. Drummond Hay, Consul General at Valparaiso, sent a report, on the 28th of November, respecting silver in Chile and Bolivia. The mines of Caracoles, in the latter State, began to produce regularly in 1871, and now yield annually about 600,000 marks—a mark weighing 8 oz., and being valued at 10 dollars gross. The 16 richest mines (those of Descubridoras) have in five years produced 22,000,000 dollars' worth of silver, and the remaining mines of Caracoles a little over a fifth of that amount. In the Deseada mine silver has been produced at a cost of 1 dollar per mark; in the Descubridoras mines at a little less than 2 dollars; and the average may be estimated at 3½ dollars per mark, exclusive of the cost of turning the ore into bar-silver.

Besides Caracoles, four districts of Bolivia contain mines, yielding from 40,000 to 50,000 marks per month. The principal mines of Caracoles are almost exhausted in the upper region, and the further production depends on finding in those mines a second region on a lower level, at a depth of probably 200 to 300 metres, on the continuance of a paying lode in the mines now worked at a level of 120 to 150 metres, on economy in working the low metals, and on a supply of capital for working more mines which are well situated, with good lodes. The average ley or fineness of the Caracoles ores is said to be larger than that of Nevada, but the cost of carriage to the coast is very high.

There are upwards of 200 mines in Chile. The yearly production is estimated at 5,500,000 dollars in Chile, and 11,000,000 dollars in Bolivia. The export of gold coin from Chile in 1876 is said to have been as much as 550,000 *l.*, and it is now rarely seen in circulation. The average coinage at Santiago during 21 years has been 702,827 dollars of silver, and 828,383 dollars of gold; in

in 1874 there was coined 133,980 dollars of gold, and 1,511,588 of silver; and in 1875, 73,428 dollars of gold, and 2,161,613 of silver.

Though gold is the only metal which has a fixed price by law, Chile virtually adopts the bimetallic system; but, owing to the scarcity of gold, silver may be now considered as the basis of the currency.

On the 14th of January 1877, Mr. West forwarded a report, by one of the principal bankers in Buenos Ayres, on the silver currency of the Argentine Republic. There being no coined money of a national character, and the Constitution of 1860 having taken from the provincial mints the right to coin money, it has become necessary to legalise the circulation of foreign silver. Till 1873 the Republic used the paper dollar of Buenos Ayres, the "peso plata" of 17 and the "peso fuerte" of 16 to the gold ounce (both, however, being only moneys of account), and the "onza de oro," generally taken as the monetary unit, and equal to about 65 s. In 1875 the minting of gold and silver coins was authorised, the relative value of silver to gold being fixed at 16·266 to 1. By a decree of June 1876 the Government established the values of foreign gold coins, taking for a basis the new Argentine peso fuerte, containing $1\frac{1}{2}$ gramme of fine gold; the sovereign was made equal to 4 pesos fuertes 88 cents, and other coins in proportion. Two or three of the most commonly current silver coins were valued at the same time, but, owing to the fall in the price of silver, the rates were, in September 1876, reduced by about 10 per cent., the values then fixed giving the proportion of silver to gold as 18·3 to 1.

In the province of Buenos Ayres silver is very little used, almost all transactions being made in gold or inconvertible paper money. In the other 13 provinces, however, silver is the base of nearly all commercial transactions, the Bolivian dollar two-thirds fine being taken as the unit, represented by half-dollars or cuatros. This coinage has no recognised legal value, and the object of the Government is, no doubt, to displace it by the peso fuerte; the total amount of these half-dollars in circulation may be roughly reckoned as equal to 700,000 l.

The richest silver-producing district in the Republic is Cerro Negro, but the industry is in the hands of small traders without the necessary intelligence or capital. Silver is imported from Bolivia, Chile, and Peru, and is shipped in small quantities to England.*

The production and consumption of silver in Japan is reported by Sir Harry Parkes to be very small. The amount produced from both Government and private mines in 1876 was only 255,213 ounces; but some increase is expected in 1877. The importation of silver from 1872 to the middle of 1876 amounted only to the value of 7,376,944 dollars, the whole of which consisted of Mexican dollars, except silver bullion to the value of 115,696 dollars, and 6,841 trade dollars in 1875-76. It is doubtful, however, whether the imports of silver bullion from San Francisco and China are even approximately stated. The exports amounted to nearly 16 millions of dollars, of which seven millions are Mexican, and about eight millions Japanese, old and new coins; silver bullion was exported to the value of 822,140 dollars, and trade dollars to that of 86,013 dollars. The exports of gold coin in the same period were valued at $21\frac{1}{2}$ million dollars, and $6\frac{1}{4}$ million dollars of Nibukin coin (a mixture of gold and silver) were also exported. The import of gold bullion was about two million dollars, and the export not much less.

From the opening of the mint at Osaka, in August 1871, to the 30th of June 1876, gold was coined to the value of $50\frac{1}{2}$ million dollars, and silver to that of 17 million dollars, less than two millions of which were coined in 1875-76.

Statistics and Commerce Department,
India Office, 21 March 1877.

Henry Waterfield.

SUMMARY.

ARGENTINE
REPUBLIC.

Page 122.

JAPAN.

Sir H. Parkes,
22 January 1877.
Page 124.

* A decree was issued in March 1877, fixing the price of the silver coins in circulation in the Argentine Republic, as follows:—

Chileno Dollar	-	-	25 grammes, ley de 900 milésimos, denominatd 500 grains	-	88 cts.
Peruvian Sol.	-	25	" " " 900	"	88 "
Bolivian Dollar	-	20	" " " 900	"	69 "
Bolivian 20-cent. piece	-	4,500	" " " 900	"	15 "
The $\frac{3}{4}$ Bolivian, and Chileno Piece, of year 1864, 1866	-	5	" " " 900	"	17 "

The effect of this decree is said to have been to prevent the export of a considerable quantity of silver to Europe.—H.W.

SILVER QUESTION.

INDIA.

INDIA.

EXTRACT of a Telegram from the Viceroy, dated 2nd February 1877.

PRICES in India do not as yet show any fall in the value of silver. Trade shows slightly accelerated growth of exports and cessation of growth of imports.

LETTER from the Government of India to the Secretary of State for India,

Fort William, 9 February 1877.

No. 49 (Financial).

IN reply to your Lordship's Despatch, Statistics and Commerce, No. 112, dated 31st October 1876, and in continuation of our Telegram, No. 648, dated 2nd February, we have the honour to forward herewith a note containing all the information that we can at present supply regarding the effects of the fall in the gold-price of silver on trade and remittance and on prices in India, and a narrative of the applications made to us to remedy these effects, and of the action which we have taken thereon.

2. We have invited the several Chambers of Commerce to give us any information upon the subject which they can furnish, and will transmit the replies as soon as they reach us.

3. We have been engaged for some time past in the preparation of tables showing the variations in all parts of India of the retail prices of grain and of the wages of agricultural labour for a series of years past. These tables, when completed, will, we expect, further illustrate the fluctuations in India of the value of silver. We intend to lay them, in due time, before Her Majesty's Government.

We have, &c.

(signed) *Lytton.*

H. W. Norman.

A. Hobhouse.

E. C. Bayley.

A. J. Arbuthnot.

A. Clarke.

J. Strachey.

NOTE regarding the Effect of the Fall in the Price of Silver on Trade and Remittances and on Prices in India, with a Narrative of the Applications made to the Government of India for Remedial Measures, and of the Action of Government thereon.

I.—*Effect of the Fall in the Price of Silver on Trade and Remittances and on Prices.*

The fall in the value of silver measured in gold dates from November 1872. For 22 years before that date, the price in London of an ounce Troy of standard silver had never been below 60 *d.*, and for 18 years more it had never been below 59 *d.* In the calendar year 1873 the average price was 59·22 *d.* the lowest price (13th November) being $57\frac{1}{16}$ *d.* In 1874 the average price was 58·37 *d.*, the lowest price (31st December) being 57½ *d.* In 1875 the average price was only

only 56·76 *d.*, the lowest quotation being (on the 3rd June) 55½ *d.* In 1876 the average price fell to 53·08 *d.*, the lowest quotation being (8th July) 47 *d.*; sales were reported even as low as 46 *d.* The recovery from that lowest depression, though it may be temporary, has been rapid; the highest point since attained being (18th January 1877) 58½ *d.*

The statistics of the foreign trade of India (exclusive of treasure) during this period are as follows (in crores and lakhs of rupees :—

From 1st April to 31st March (Official Year).

	1873-74.	1874-75.	1875-76.
Exports - - - - -	54·96	56·31	58·04
Imports - - - - -	31·64	34·64	37·07
NET EXPORTS - - - - -	23·32	21·67	20·97

From 1st April to 30th November (Eight Months.)

	1873.	1874.	1875.	1876.
Exports - - - - -	32·28	34·09	35·90	37·93
Imports - - - - -	20·11	22·23	22·64	22·52
NET EXPORTS - - - - -	12·17	11·86	13·26	15·41

These figures show a slightly accelerated growth of the export trade, and an interruption of the growth of the import trade, the result being, especially in 1876, a considerable increase in the value of the net exports. It is to be remembered, however, that important alterations of the tariff values and of the customs duties were made in the middle of 1875, the effect of which upon trade it is difficult to discriminate. But, probably, the interruption of the growth of the import trade may be attributed, in the main, to the depreciation of silver relatively to gold.

The silver-prices of imported goods in India, as will be seen presently, have not risen, and the circumstances would appear to have been unfavorable to importers. It is understood, however, that, on the whole, the import trade has not, latterly, been unprofitable. The total value of cotton manufactures (the most important of Indian imports imported into India in the first eight months of 1875-76 shows no decrease as compared with earlier years. The figures are as follows, in rupees (omitting 000 :—

1st April to 31st March (Official Year).

1873-74.	1874-75.	1875-76.
15,15,57	16,26,36	16,42,89

1st April to 30th November (Eight Months).

1873.	1874.	1875.	1876.
11,84,10	12,96,55	11,89,70	12,18,51

The increase of exports is the more remarkable in that it is contemporaneous with a serious contraction of the value of exports of raw cotton, the most important of Indian exports. The figures are as follows (omitting 000) :—

VALUE of RAW COTTON exported from India.

From 1st April to 31st March (Official Year).

	1873-74.	1874-75.	1875-76
Cwts. - - - - -	45,00	56,00	50,10
Value in Rupees - - -	13,21,62	15,25,73	13,25,90

1st April to 30th November (Eight Months).

	1873.	1874.	1875.	1876.
Cwts. - - - - -	29,77	36,52	37,38	32,54
Value in Rupees - - -	8,89,93	9,98,46	10,09,32	8,16,32

INDIA.

The following Table shows the exports the value of which has increased in 1876: the values of the same exports for the last three complete years are prepared. The development of the exports of cotton goods, wheat, seeds, sugar, and tea has been favoured by the fall in sterling exchange. The export trade of the past year is stated to have been very profitable to all concerned, including the producers:—

VALUE of EXPORTS which show Improvement in 1876, compared with 1875.

[In Rupees, omitting 000.]

ARTICLES.	During Whole Year, from 1st April to 31st March.			During Eight Months, from April to November, inclusive.			
	1873-74.	1874-75.	1875-76.	1873.	1874.	1875.	1876.
	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>
Cotton, Manufactures of	52,26	50,14	65,90	33,56	32,50	41,04	55,54
Coffee	1,48,75	1,30,53	1,62,70	60,07	63,86	58,68	61,03
Indigo	3,55,53	2,57,63	2,87,92	65,26	33,32	31,78	46,19
Wheat	82,76	49,04	90,10	39,88	38,67	65,58	1,32,65
Hides and Skins (dressed or tanned)	63,47	50,58	1,19,01	44,98	32,24	73,99	95,24
Jute (Raw) and Gunny Bags	3,63,26	3,48,03	3,23,65	2,19,74	2,34,16	1,79,82	2,31,65
Opium	11,34,19	11,95,70	11,14,84	7,20,57	7,85,97	7,31,47	8,38,36
Seeds	2,36,14	3,23,59	5,46,20	1,51,29	1,88,75	3,42,79	4,04,43
Sugar	22,78	31,92	25,38	16,34	25,64	20,76	41,49
Tea	1,74,29	1,93,74	2,16,64	1,17,54	1,22,53	1,42,71	1,85,11
Wool (Raw)	93,83	95,99	1,09,42	58,80	65,47	68,02	72,99
Shawls	19,97	16,70	16,13	14,30	11,83	11,77	13,32

Page 21. The appended Table (A) contains the statistics of the net imports of treasure during 1876-77 and in previous years. The amount of Government bills drawn upon India and the amount borrowed by the Government are also shown in this Table, as illustrating the subject. The exports of gold exceeded the imports, for the first time, during the nine months April to December 1876. This unusual phenomenon continued during the five months June to October, and must apparently be attributed to the relative values of gold and silver not having varied in the same proportion in India as in other parts of the world.

As to remittances, the rate of exchange has, necessarily, followed closely the price of silver. There is reason to believe that the alarm felt in the early part of 1876, as to the future value of silver, led to banks and others making great efforts to withdraw their capital from the East to the West, and that this movement may partly explain the extreme depression in June and July 1876. The retransmission of capital to the East, on the partial restoration of confidence, may explain the rapidity of the subsequent recovery in the value of silver and of the exchange with gold.

Pages 22-25.

Two other Tables (B and C) are appended to this Note, showing the variations in the prices of the chief staple commodities at Bombay and in Calcutta since the beginning of 1873.

It will be observed—

(1.) That, with the exception of spelter and gold, the prices of imports are generally lower at the end of this period than they were at the beginning; and that there has been no marked rise in the prices of imported commodities since the beginning of 1876.

(2.) That

(2.) That the following exports show a more or less considerable rise in price since the beginning of 1873: *Jute, Rice, Silk, Tea, Coffee*; and the following since January 1876: *Indigo, Rice, Silk, Tea, Wheat*.

(3.) That *Cotton, Wool, Hides, Lac, Saltpetre, and Wheat* show a decrease of price as compared with the beginning of 1873; but that the prices of *Wool, Wheat, Lac, and Saltpetre* have materially recovered since the beginning of 1877.

There are special causes for the improvement of the prices of most of the articles which show improvement; and, upon the whole, these Tables do not appear to indicate any decrease in the value of silver: the prices of all articles of export have, however, doubtless been stimulated by the low rate of exchange.

II.—*Applications made to the Government of India for measures in remedy of the Effects of the Fall in the Gold-price of Silver; and the action taken thereon.*

On the 17th July 1876 the Secretary to the Bengal Chamber of Commerce transmitted, for the consideration of his Excellency the Governor General in Council, the following two Resolutions, adopted at a special general meeting of the Chamber, held on Saturday the 15th July:—

RESOLUTIONS.

1st.—“That the continued depreciation in the value of silver is a question most seriously affecting the political and financial interests of the country; and that, in view to its very great importance, the Committee be requested to address the Government, in order to obtain such information as they may be able to give in regard to the policy which they propose to pursue under the circumstances.

2nd.—“That the Chamber approves of the suggestion of the Committee that it is expedient, in view of any ultimate measures that the Government may adopt, that Clause 19 of Act XXIII. of 1870, making it obligatory on the Mints in India to receive all silver tendered for coinage, and also Section 11, Clause (b) of Act III. of 1871, making it obligatory on the Currency Department to issue notes against silver bullion sent in, be temporarily suspended, at the discretion of Government; and that during such suspension, or till further notice, it be not lawful to import coined rupees from any foreign ports.”

On the 22nd July the Secretary to the same Chamber forwarded, for the consideration of the Governor General in Council, copy of the proceedings of the Chamber at the special general meeting aforesaid.

In this letter the Committee of the Chamber, while recognising the difficulty of the position of the Government of India, remarked that the uncertainty that had hitherto shrouded the action of Government had been attended with serious consequences to merchants and bankers, and would so continue to attend their transactions so long as they were kept in ignorance of the course of action the Government propose to take. The Committee, therefore, expressed a hope that his Excellency the Viceroy would, in the interests of commerce and of the country generally, accede to the prayer of the first resolution of the meeting, and make public the intentions of the Government.

As to the second resolution, the Committee pointed out that its object was not to prohibit coinage altogether (for that would be likely to bring about a collapse of credit), but to place all coinage in the hands of the Government, to be exercised at their discretion. It appeared to the Committee suicidal for the Secretary of State to allow the competition of bar-silver with the rupees which he has to offer to those requiring money in India, and that to suspend the free conversion of silver bullion into legal-tender coin was not only wise and reasonable, but a necessary precaution for the Government of India to take for the preservation of their own currency, and to support the credit of their own loans, as well as to prevent the country from being swamped by silver sent in by foreign nations.

The Committee argued that the fact that the Government of India was compelled “to put their Mint Stamp to all silver” sent to India “had given an

INDIA.

artificial and fictitious value to silver," which would cease as soon as the law was suspended. "Bar-silver would then gradually fall to its own intrinsic value, and the extent to which it was depreciated would be soon gauged; whereas, as things were, it was impossible to say how much its value was appreciated by our 'open coinage system.'"

When all Europe was closing its doors against the import of silver, with the avowed object of having as little of the metal as possible, should the depreciation be found permanent, it seemed most impolitic, the Committee thought, "to keep ours wide open for the reception of an unlimited quantity, costing the country, through our coinage laws, far more than its real intrinsic value." The Committee could see no valid reason against the immediate adoption by the Government of the second resolution of the meeting, and considered that the objections brought against it were based either on a misconception of its real scope, or on abstract principles (ignored by other States); whereas the position of affairs was altogether exceptional, and ordinary rules did not apply. The Committee represented that the measures recommended in the resolution were not more stringent than (in fact, scarcely so stringent as) the first financiers in Europe had found it necessary to adopt.

Lastly, the Committee pointed out that there was a third proposition put before the meeting, recommending the adoption of a gold standard, which, in deference to the feeling apparent among members present, was temporarily withdrawn; and they referred the Government to the debate at the meeting upon this proposal.

On the 31st July the Government of India published a resolution inviting attention to the immediately probable financial consequences of the fall in the gold-value of silver, and insisting upon the necessity for the utmost economy of the public resources.

On the 1st August the Secretary to the Calcutta Trades Association forwarded a memorial from the Master, Wardens, and Committee of the Association to his Excellency the Viceroy and Governor General of India in Council.

In this document the memorialists represented that they had for many months past been suffering great loss from the low rate of exchange, which bid fair to paralyse trade. The memorialists joined earnestly with the Bengal Chamber of Commerce in urging on the Government the importance of declaring the policy it intended to pursue for the remedy of this evil, and prayed that the policy of a temporary suspension of the compulsory coinage of silver might receive the early consideration of Government.

The memorialists further expressed great satisfaction at the desire manifested by the Government to encourage local manufactures, and suggested a relaxation of the rules against the purchase of imported stores for the Government in India.

On the 22nd September 1876, after considering the "Report by the Select Committee of the House of Commons on Depreciation of Silver, with the proceedings of the Committee, ordered by the House of Commons to be printed on the 5th July 1876," the Government of India published a Resolution (No. 3,044) upon the suggestions of the Bengal Chamber of Commerce and the Calcutta Trades Association, in which the following arguments and conclusions were stated:—

1. The recent change in the value of silver, measured in gold, may be due to changes in the value of one metal or the other, or of both. Before a fit remedy can be applied, it is essential to ascertain what exactly has happened, whether gold has risen or silver fallen, and how much the value of each metal has changed. It cannot be assumed, without decisive proof, that the divergence of the two metals is due wholly, or even chiefly, to the fall in the value of silver.

2. The prices of commodities and of the precious metals, in London and in India, witness to a considerable rise in the value of gold since March 1873, and especially since December 1875, and do not show any fall in the value of silver measured in commodities other than gold. Using these prices with all reserve, it must still be said that they afford evidence of this fact, at least, that a rise in the value of gold is one of the causes which has disturbed the equilibrium of the two metals.

3. The

3. The divergence of the values of the two metals seems due to three principal causes, of which the first appears to be the most efficient :

(1.)—The substitution of gold as the standard of value, in Germany, the Netherlands, and the Scandinavian Kingdoms, for silver, and in the countries of the Latin Convention, for their customary alternative or compensatory standard of silver and gold.

(2.)—The increased production of silver in the United States of America.

(3.)—The decreased demand for silver in India.

4. The value of gold and silver, like that of any other commodity, depends on the one hand upon their supply, on the other upon the demand for them, which again depends upon the uses made of them. The long-continued equilibrium between the value of gold and that of silver is due to the two metals having shared, without material change of conditions, the only great field for the employment of either of them—*i. e.*, the supply of legal-tender metallic money. This equilibrium has been disturbed by the rapid supersession of silver by gold in Europe and America as the standard of value, and therefore as the material of legal-tender metallic money. This supersession is calculated *à priori* to raise the value of gold no less than to lower the value of silver.

5. Excessive importance is not, *per se*, attached to the increased production of silver in the United States of America.

6. When India is in a normal condition—*i. e.*, when there is no abnormal demand for any of her staples, and she is not borrowing large sums from abroad—the amount of treasure required to settle her accounts with the world is not considerable, and of the treasure received a substantial proportion has always been gold. The large imports of treasure into India since 1850 are due to abnormal circumstances, as follows :—

(1.)—The Crimean War transferred to India large demands for produce theretofore obtained from Russia.

(2.)—The American Civil War exaggerated temporarily the value of Indian cotton.

(3.)—Great sums of money have been borrowed for—

(a.) The suppression of the Mutiny ;

(b.) The construction of Railroads (Guaranteed and State) and Canals ;

(c.) The Bengal Famine.

It would be altogether misleading to treat the great imports of treasure in the last 25 years as normal, or to expect that they will or can continue. There is, therefore, no reason to expect that silver will be poured into India, although, of course, if it falls in value, a greater weight of it must come to represent the same value.

7. To suspend the free coinage of legal-tender metallic money, as advocated by the Bengal Chamber of Commerce, would give a monopoly value to the existing stock of rupees, and so reduce prices ; whereas prices are not yet risen.

8. The value of no substance can serve as a standard measure of value, unless its use as the material of legal-tender currency is freely admitted. If, therefore, the free coinage of silver on fixed conditions were disallowed in India, silver would no longer be the standard of value of India, but another standard would be substituted—*viz.*, the monopoly value of the existing stock of rupees, tempered by any additions made to it by the Government, or illicitly. If no such additions were made, the value of the rupee would gradually but surely rise, owing to the supply being cut off.

9. The stamp of a properly regulated mint, such as the Indian Mints, adds nothing, except the cost of manufacture and seignorage, to the value of the metal on which it is impressed, but only certifies to its weight and purity.

INDIA.

10. A sound system of currency must be automatic or self-regulating. No civilised Government can undertake to determine from time to time by how much the legal-tender currency should be increased or decreased, nor would it be justified in leaving the community without a fixed metallic standard of value even for a short time. It is a mistake to suppose that any European nation has rejected silver as a standard of value without substituting gold.

11. For all these reasons, the Government of India rejected as inadmissible the proposal that the mints should be closed to the free coinage of silver for the public on fixed conditions, without at the same time opening them to the free coinage of gold as legal-tender money on fixed conditions.

12. The Government of India further concluded that there was nothing as yet demanding recourse to a measure so costly, and of which all the conditions were so uncertain, as the adoption of a gold standard. Thus the conclusions stated in the resolution were—

1st. That the divergence of the values of gold and silver is not necessarily attributed only to a diminution in the value of silver; that there are strong reasons for believing that gold may have increased, as well as that silver has decreased, in value, and that this consideration must have an important bearing on the action of Government in reference to the present disorder.

2nd. That although it is most desirable, in the interests of trade, that the standard of value in India should be the same as the standard of value in the chief countries with which India interchanges commodities, yet trade will not be permanently injured by a fall in the value of the rupee measured in gold, provided only that a fresh stable equilibrium of the precious metals be attained.

3rd. That up to the present moment there is no sufficient ground for interfering with the standard of value.

The only other representations received upon the subject by the Government of India have been complaints by various European officers in its service of the loss which they are suffering from the fall of the sterling value of the rupee, and prayers for assistance from the State.

These memorials are still under consideration, either by the Government of India or the Secretary of State.

Financial Department, Calcutta, 9th February 1877.

TABLE (A.)

NET IMPORTS OF GOLD AND SILVER INTO INDIA; BILLS DRAWN IN LONDON UPON THE GOVERNMENT OF INDIA; AND DEBT INCURRED BY THE GOVERNMENT OF INDIA.

(In Crores and Lakhs of Rupees.)

Y E A R S.	Number of Years.	Net Imports.			Average Yearly Net Imports.			Proportion of Net Gold to Total Net Imports.	Bills drawn upon Government of India.	Average Rate of Exchange at which Bills were Sold.	Borrowed by Government of India, including Guaranteed Railway Capital.			Average Price of Standard Silver in London per Oz. Troy.
		Gold.	Silver.	Total.	Gold.	Silver.	Total.				England.	India.	Total.	
	<i>Yrs. m.</i>									<i>Pence.</i>				<i>Pence.</i>
1800-35	- - - 35 0	-	-	75.11	-	-	2.15	-	-	-	2.41	22.76	25.17	-
1835-50	- - - 15 0	8.19	23.94	32.13	.55	1.59	2.14	25.49	34.47	22.55	.78	11.04	11.82	59.66
1850-55	- - - 5 0	5.39	11.92	17.31	1.08	2.38	3.46	31.12	16.94	23.88	5.27	—2.04	3.23	61.40
1855-66	- - - 11 0	56.82	118.87	175.69	6.16	10.81	15.97	32.34	35.58	24.66	76.93	20.86	97.79	61.54
1866-72	- - - 5 11	25.05	35.93	60.98	4.23	6.07	10.30	41.07	40.79	23.05	46.34	5.15	51.49	60.83
1872-73	- - - 1 0	2.54	.71	3.25	2.54	.71	3.25	78.15	15.08	22.81	.16	—1.47	—1.31	60.16
1873-74	- - - 1 0	1.38	2.45	3.83	1.38	2.45	3.83	36.03	14.26	22.35	1.08	—04	1.04	59.16
1874-75	- - - 1 0	1.87	4.64	6.51	1.87	4.64	6.51	28.72	12.00	22.22	5.84	3.40	9.24	58.16
1875-76	- - - 1 0	1.54 Exports. 54	1.56	3.10	1.54	1.56	3.10	49.68	14.50	21.64	1.86	2.93	4.79	56.20
1876, April to December	- - - 0 9	54	4.62	4.08	54	4.62	4.08	-	12.17	20.22	5.07	.36	5.43	52.62
TOTAL	- - - 76 8	102.24*	204.64*	381.99	17.81*	34.83*	51.79	33.32*	195.77*	22.64*	145.74	62.95	208.69	-
YEARLY AVERAGE	- - -	2.45*	4.91*	4.98	1.98*	3.87*	5.48	-	4.70*	-	1.90	.82	2.72	58.86

* These Totals and Averages are for the Years from 1835-36 onwards.

TABLE (B.) - - - - -

VARIATIONS in the Wholesale Prices of certain STAPLE COMMODITIES

	1873.		1874.		1875.									
	January.	July.	January.	July.	January.	July.	January.	July.	18 August.	25 August.	1 September.	8 September.	15 September.	
I M P O R T S.														
Grey Shirtings (8½lbs.) - - -	100	102	94	93	86	89	91	87	89	-	-	-	-	1
Mule Twist, No. 40 - - -	100	94	85	-	83	87	83	79	81	79	-	-	-	2
„ Turkey red, Nos. 40-80	100	-	-	95	91	98	86	82	64	-	-	-	-	3
„ Orange dye, Nos. 40-60	100	98	95	90	85	-	-	81	-	-	-	-	-	4
Copper, Sheathing - - -	100	102	107	100	106	105	-	104	102	101	-	-	-	5
„ Braziers - - -	100	101	108	99	106	104	103	104	100	98	97	98	-	6
„ Australian - - -	100	98	100	94	102	-	104	99	95	-	94	95	-	7
Iron: flat, square, and bolt - -	100	120	131	110	93	87	90	79	-	-	-	-	-	8
Spelter - - -	100	111	109	111	108	123	120	124	119	-	-	118	-	9
Coffee, Mocha - - -	100	110	126	120	122	118	122	128	-	-	-	-	-	10
„ Malabar - - -	100	124	138	122	114	123	126	138	-	-	-	-	-	11
Ivory, large - - -	100	95	89	95	92	-	-	115	110	-	-	-	-	12
„ middling - - -	100	103	91	100	94	-	-	124	123	-	-	124	-	13
Silk, China, Nankeen - - -	100	93	87	-	-	-	-	82	-	-	-	-	-	14
„ „ Canton, No. 5 - - -	100	84	89	-	-	-	111	98	-	-	-	-	-	15
E X P O R T S.														
Linseed - - -	100	97	-	93	100	88	92	94	92	95	-	95	-	16
Cotton, Surat - - -	100	-	94	81	83	85	89	69	-	-	-	-	-	17
„ Broach - - -	100	84	94	81	83	85	90	69	-	-	-	-	-	18
„ Oomrawati - - -	100	91	89	80	78	-	80	71	72	-	73	75	-	19
„ Dholera - - -	100	91	84	81	76	81	82	75	78	-	77	78	-	20
Wool, Mekran - - -	100	90	58	61	77	79	66	55	-	-	60	-	-	21
„ Khorasan - - -	100	97	70	65	70	69	54	-	49	-	58	-	-	22
„ Marwar - - -	100	112	78	75	91	105	97	101	-	-	-	-	-	23
„ Cutch - - -	100	88	78	67	82	79	69	70	71	-	82	-	-	24
Sugar, Bengal, No. 1 - - -	100	96	92	-	98	92	-	88	-	-	-	-	-	25
„ Mauritius, No. 1 - - -	100	97	91	-	97	91	86	-	-	-	-	-	-	26
Wheat, Sohagpur Pissi - - -	100	-	75	82	79	72	77	81	-	-	-	-	-	27
„ Khundwah Seoni - - -	100	95	77	76	74	73	76	75	-	-	-	-	-	28
„ Lasalgaum - - -	100	105	78	75	-	79	76	78	-	-	-	-	-	29
„ Jubbulpore - - -	100	-	81	87	77	76	85	82	-	-	-	-	-	30

TABLE (B.)

at Bombay; taking the Prices of January 1873=100.

1876.														1877.				
22 September.	2 October.	9 October.	16 October.	23 October.	30 October.	6 November.	13 November.	20 November.	27 November.	4 December.	11 December.	18 December.	25 December.	1 January.	8 January.	15 January.	22 January.	29 January.
1	-	87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	85	-
2	77	-	-	-	-	-	79	-	-	-	-	-	-	77	79	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	100	-	97	-	-	-	-	-	93	-
6	99	-	-	100	98	-	-	99	99	-	96	95	-	-	-	-	93	94
7	-	-	-	-	-	-	-	97	-	-	94	93	-	94	-	-	92	-
8	-	71	74	-	79	-	-	-	76	-	75	73	-	79	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	115	114	-	-	-	-	110	-
10	-	-	-	-	-	-	-	-	-	-	-	-	-	117	-	-	-	-
11	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	-	-	-	-	112	-	-	-	121	-	-	-	116	-	-	-	-	107
15	-	-	-	-	112	-	-	-	107	-	-	-	107	-	-	-	-	104
16	100	-	-	-	108	109	-	110	-	111	-	100	-	-	-	96	103	108
17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	72	-	-	-	-	75	79	75	76	-	89	-	76	90	92	-	-	91
19	77	-	75	-	-	76	80	78	-	-	87	89	87	90	92	91	-	93
20	79	-	-	-	-	81	86	82	84	-	85	86	87	89	91	93	-	94
21	-	-	-	-	-	-	68	-	72	71	81	-	82	-	-	-	-	-
22	-	-	-	-	77	-	74	-	78	69	76	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	-	-	-	-	-	-	85	-	-	82	86	-	-	-	-	-	-	-
25	-	-	-	-	85	-	-	-	89	-	-	-	93	-	-	-	-	95
26	-	-	-	-	91	-	-	-	95	-	-	-	99	-	-	-	-	111
27	-	-	-	-	86	-	-	-	88	-	-	-	88	-	-	-	-	91
28	-	-	-	-	81	-	-	-	97	-	-	-	91	-	-	-	-	90
29	-	-	-	-	90	-	-	-	100	-	-	-	100	-	-	-	-	103
30	-	-	-	-	88	-	-	-	93	-	-	-	94	-	-	-	-	96

T A B L E (C.) - - - - -

VARIATIONS in the Wholesale Prices of certain STAPLE COMMODITIES

	1873.					1874.				1875.							
	March.	June.	July.	September.	December.	March.	June.	September.	December.	March.	June.	September.	December.	January.	February.	March.	April.
IMPORTS.																	
Grey Shirtings (8½ lbs.) -	100	99	-	97	93	-	97	87	84	86	85	84	-	85	84	86	84
Mule Twist:																	
White, good, No. 40 -	100	97	99	90	96	95	92	90	91	92	88	87	-	86	91	90	86
Turkey red, No. 40-12 lbs.	100	104	112	108	115	112	106	104	-	102	-	96	94	92	98	92	-
Orange, Nos. 40-60 -	100	113	-	110	107	102	95	90	93	-	92	88	87	80	87	-	88
Copper, Sheathing -	100	101	99	97	102	100	95	-	100	103	99	100	102	101	100	99	-
" Braziers -	100	-	97	96	102	98	95	97	100	103	100	-	101	97	101	99	101
" Australian -	100	106	110	100	109	115	106	101	106	108	106	102	108	110	109	107	109
Iron : flat, bolt, bar, and square.	100	109	111	112	115	122	108	100	89	93	85	73	78	81	79	-	82
Spelter, hard -	100	105	-	-	114	100	105	114	118	148	137	136	148	-	168	151	152
Gold, Australian, 23 carats fine.	100	100·37	100·74	-	101·87	98·88	100·37	100	100·7	100·74	101·12	-	101·87	-	-	104·87	102·99
Gold* - - -	100	100·74	100·63	101·06	103·04	102·79	101·27	103·57	104·37	104·14	107·03	105·40	106·46	108·87	111·91	111·72	-
EXPORTS.																	
Hides, buffalo, slaughtered, Patna.	100	97	94	-	92	96	-	92	88	83	-	75	-	79	71	-	60
Hides, cow, slaughtered -	100	-	94	100	-	106	100	-	-	97	84	74	78	-	-	-	-
Indigo, good - - -	100	Nom.	-	-	110	Nom.	-	-	-	-	-	-	90	91	95	Nom.	-
Jute, picked - - -	100	97	-	119	144	137	144	-	137	132	122	119	125	141	137	128	131
" ordinary - - -	100	81	-	103	129	123	129	-	123	119	100	103	113	123	-	119	-
Lac dye, fine - - -	100	95	-	-	87	Nom.	55	-	60	73	-	55	-	-	-	45	-
" middling - - -	100	89	-	40	78	Nom.	33	-	-	44	-	22	-	-	-	-	-
Shell lac, fine orange -	100	112	115	127	129	149	161	166	183	-	166	149	119	105	97	102	98
" middling - - -	100	113	116	131	127	149	155	173	187	-	164	127	100	95	82	87	73
Linseed, fine, bold, clean -	100	102	105	108	111	123	103	106	110	96	90	-	92	90	88	-	85
Rice, moonghy - - -	100	97	139	108	150	153	161	Nom.	-	-	-	128	117	111	115	114	-
" ballam - - -	100	101	100	-	165	153	167	-	153	112	126	141	135	118	123	119	115
Saltpetre, 2-4 per cent. re-fraction.	100	94	-	95	91	81	80	86	83	75	73	76	74	72	70	-	69
Silk, raw, Cossimbazar -	100	89	93	84	80	89	80	60	58	62	-	53	40	53	58	-	56
" Gonatea - - -	100	91	95	86	82	91	82	52	59	64	-	55	43	55	59	-	57
" Jungypoor - - -	100	90	88	81	79	86	81	59	-	62	-	52	43	52	55	-	59
" Radanagore - - -	100	87	-	78	76	87	76	59	56	59	56	52	39	48	54	-	56
" Surdahs - - -	100	87	92	83	79	87	83	58	56	60	-	52	42	46	54	-	56
Sugar, Benares - - -	100	-	94	-	-	87	-	-	-	-	-	-	-	-	-	-	Nom.
" date, Gurratta - -	100	97	87	82	-	77	-	-	-	-	-	72	-	-	Nom.	-	68
" Dulloah - - -	100	96	86	100	-	-	96	-	-	-	-	-	-	-	-	86	-
Tea, Fine Pekoe - - -	100	109	126	123	-	119	126	119	123	126	-	129	135	-	-	142	N.
" Good Souchong - -	100	114	-	-	-	-	123	118	123	125	114	109	104	95	-	109	N.
" Congou - - -	100	112	125	-	119	N.	137	-	150	-	125	112	119	106	-	112	N.
Wheat, Doodiah - - -	100	94	-	107	115	107	111	100	96	87	76	78	-	76	-	74	-

* These prices of Gold are calculated from the prices in Sterling of Bar Silver in the London Market.

TABLE (C.)

at Calcutta; taking the Prices of March 1873=100.

1876.															1877.		
May.	12 June.	26 June.	10 July.	24 July.	7 August.	21 August.	4 September.	18 September.	12 October.	26 October.	9 November.	25 November.	7 December.	21 December.	4 January.	17 January.	1 February.
83	80	-	-	-	82	80	79	78	-	-	-	-	-	-	-	80	82
84	86	84	-	86	84	-	-	-	-	83	-	86	-	87	90	91	-
88	-	90	-	-	-	-	-	-	89	-	-	-	-	85	-	-	-
87	88	-	-	90	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	98	-	-	-	99	99	96	95	93	92	91	88
-	-	-	-	100	99	-	-	-	98	99	99	96	95	93	92	91	88
108	107	106	-	-	104	102	99	-	104	105	-	-	103	100	-	99	96
79	75	73	-	-	72	71	-	72	71	-	71	69	68	-	67	65	-
148	-	150	151	153	-	-	152	153	150	153	155	-	148	143	-	139	132
103-87	107-86	-	110-86	113-86	110-86	107-86	113-86	110-11	109-36	-	105-62	107-86	103-37	-	101-87	103-87	-
4-90	115-46	118-31	127-18	120-71	116-58	115-45	116-02	116-44	114-63	112-46	110-52	109-63	105-52	106-00	104-36	103-02	103-91
63	65	-	-	-	-	-	-	-	-	71	88	-	94	104	94	-	-
-	-	74	-	Nom.	-	-	-	-	-	-	-	-	-	96	-	76	75
-	-	-	-	-	-	-	-	-	-	-	-	-	115	110	-	108	103
137	-	-	134	144	-	-	137	136	139	137	137	144	-	150	-	147	144
121	124	123	119	129	127	-	123	121	123	129	126	135	-	142	-	135	132
55	-	-	56	-	-	-	-	-	64	-	-	-	-	69	-	82	91
33	-	-	27	-	-	-	-	-	40	-	-	-	-	-	-	49	55
93	85	-	81	80	76	-	78	81	101	-	95	80	73	68	-	-	-
76	69	-	65	62	60	-	64	67	85	-	82	64	60	-	-	58	64
81	86	87	91	111	91	88	-	90	98	108	100	104	-	102	-	105	-
-	112	-	-	125	119	117	-	-	114	-	133	128	125	156	150	139	-
-	-	117	-	-	115	112	-	-	106	112	165	135	-	159	156	138	147
63	73	-	79	-	77	-	-	76	78	82	75	80	-	-	-	78	-
-	64	67	84	93	-	107	-	116	133	-	-	-	98	-	-	111	-
-	61	66	86	95	-	109	-	118	136	-	-	-	95	-	-	114	118
-	64	71	79	100	-	-	-	114	133	-	-	-	95	-	-	109	114
-	58	72	83	96	-	102	-	117	130	-	-	-	96	-	-	109	-
-	64	71	85	96	-	104	-	117	133	-	-	-	100	-	-	112	-
-	75	83	Nom.	-	-	-	-	-	73	-	77	89	-	88	88	85	-
Nom.	68	-	-	72	-	77	-	-	Nom.	-	-	-	-	-	-	-	97
83	87	-	93	-	-	Nom.	-	-	-	-	-	-	-	-	-	-	127
-	-	-	148	-	142	-	145	151	-	155	155	148	-	-	-	-	-
-	-	127	136	127	145	114	118	123	-	-	-	-	-	-	-	118	-
-	-	137	144	137	131	-	-	-	-	125	125	119	-	-	-	131	-
70	76	-	79	74	-	79	76	80	81	80	79	76	79	96	87	81	83

(True Copies).

D. Barbour,
Under Secretary to the Government of India.

LATIN UNION.

LATIN UNION.

DECLARATION relative à la Fabrication de la Monnaie d'Argent, pendant l'année 1876, en Belgique, en France, en Italie, en Suisse, et en Grèce. (Du 3 février 1876.)

Article 1. Les Gouvernements contractants s'engagent, pour l'année 1876, à ne fabriquer ou à ne laisser fabriquer de pièces d'argent de 5 francs, frappées dans les conditions déterminées par l'article 3 de la Convention du 23 décembre 1865, que pour une valeur n'excédant pas la somme de 120 millions de francs fixée par l'article 1^{er} de la Convention additionnelle du 31 janvier 1874.

Article 2. Ladite somme de 120 millions de francs est répartie ainsi qu'il suit :—

	<i>Francs.</i>
1°. Pour la Belgique	10,800,000
Pour la France	54,000,000
Pour l'Italie	36,000,000
Pour la Suisse	7,200,000

2°. En ce qui concerne la Grèce, qui a accédé à la Convention du 23 décembre 1865 par une déclaration du 26 septembre 1868, le contingent fixé pour cet Etat, proportionnellement à ceux des autres Gouvernements contractants, est arrêté à la somme de 3,600,000 francs.

3°. En dehors du contingent fixé au paragraphe précédent, le Gouvernement hellénique est exceptionnellement autorisé à faire fabriquer et à mettre en circulation, sur son territoire, pendant l'année 1876, une somme de 8,400,000 francs en pièces d'argent de 5 francs, cette somme étant destinée à faciliter le remplacement des diverses monnaies actuellement en circulation, par des pièces de 5 francs frappées dans les conditions déterminées par la Convention de 1865.

Article 3. Sont imputés sur les contingents fixés au paragraphe 1^{er} de l'article précédent, les bons de monnaie délivrés jusqu'à la date de ce jour, dans les conditions déterminées par l'article 6 de la Déclaration du 5 février 1875.

Est également imputée sur la somme totale de 12 millions de francs attribuée à la Grèce par les paragraphes 2 et 3 de l'article précédent, celle de 2½ millions que le Gouvernement hellénique avait été autorisé à faire fabriquer en 1876, comme équivalent des bons de monnaie que les autres Gouvernements contractants ont eu la faculté de délivrer.

Article 4. Une nouvelle* Conférence monétaire sera tenue à Paris dans le courant du mois de janvier 1877, entre les Délégués des Gouvernements contractants.

Article 5. Jusqu'après la réunion de la Conférence prévue à l'article précédent, il ne sera délivré de bons de monnaie, pour l'année 1877, que pour une somme n'excédant pas la moitié des contingents fixés par les paragraphes 1 et 2 de l'article 2 de la présente Déclaration.

Article 6. L'article 11 de la Convention du 23 décembre 1865, concernant l'échange des communications relatives aux faits et documents monétaires, est complété par la disposition suivante :—

“ Les Gouvernements contractants se donneront réciproquement avis des faits qui parviendraient à leur connaissance au sujet de l'altération et de la contrefaçon de leurs monnaies d'or et d'argent dans les pays faisant ou non partie de l'Union monétaire, notamment en ce qui touche aux procédés employés, aux poursuites exercées et aux répressions obtenues. Il se concerteront sur les mesures à prendre en commun pour prévenir les altérations et contrefaçons, les faire réprimer partout où elles se seraient produites et en empêcher le renouvellement.”

Article 7. La présente Déclaration sera mise en vigueur dès que la promulgation en aura été faite d'après les lois particulières de chacun des cinq Etats.

* The Conference has been postponed till the end of 1877.

FRANCE.

FRANCE.

Lord Lyons to the Earl of Derby.

(Commercial, No. 224.)

(Extract.)

Paris, 4 September 1876.

SINCE the Report of the Select Committee of the House of Commons, the law authorising the Government to suspend the coining of silver 5-franc pieces has been passed and promulgated, and the Government has actually suspended by decree the coining of such pieces on private account at the Mints of Paris and Bordeaux.

The debates in the Senate on this law were enclosed in my Commercial Despatch,* No. 161, of the 16th June last, which is printed in the Blue Book, and in my Commercial Despatch, No. 165, of the 24th June last.

The debate in the Chamber of Deputies I enclose herewith.

French Parliamentary documents relative to the law were inclosed in Mr. Adams' Commercial Despatch,† No. 102, of the 15th April (printed in the Blue Book), and in my Commercial Despatch, No. 163, of the 19th June, and No. 206, of the 14th ultimo.

The law itself, as promulgated, and the decree suspending the coining of silver 5-franc pieces, were transmitted to your Lordship with my Commercial Despatch, No. 198, of the 7th ultimo.

(signed) Lyons,

"Journal Officiel,"
2 August 1876.

Enclosure in Lord Lyons' No. 237, Commercial.

(Extract from "*L'Économiste Français*" of 9th and 16th September 1876.)

LA QUESTION MONÉTAIRE. RAPPORT DES DÉLÉGUÉS SUISSES À LA CONFÉRENCE MONÉTAIRE DE PARIS. Janvier et février 1876, au haut Conseil fédéral suisse.

Monsieur le président, très-honorés Messieurs,

Pour se conformer à l'article 5 de la déclaration signée à Paris le 3 février 1875, les délégués des Etats signataires de la convention monétaire de 1865 se sont réunis à Paris, le 20 janvier 1876, sur l'invitation du ministère des affaires étrangères de France. La Grèce s'était jointe aux représentants des puissances qui ont fondé l'union monétaire dite latine. Les soussignés, en se référant aux rapports qu'ils ont eu l'honneur de vous adresser au cours de la Conférence, se font un devoir de résumer ici l'ensemble des travaux auxquels vous avez bien voulu les appeler à prendre part, ainsi que les motifs qui les ont engagés à vous demander de les autoriser à signer, sous réserve de l'approbation de la haute Assemblée fédérale, la déclaration sortie des délibérations de la Conférence.

Les soussignés esquisseront d'abord l'ensemble des travaux de la Conférence. Ils exposeront ensuite les principaux changements survenus depuis une année dans le régime monétaire de divers Etats, et termineront par quelques considérations générales sur la production et la consommation de l'argent dans le monde, et sur leur influence sur la politique monétaire des Etats signataires du traité de 1865 et de Suisse en particulier.

* See page 99 of Appendix to Report from the Select Committee on the Depreciation of Silver (C 238 of 1876).

† See pages 92, 93 of ditto.

FRANCE.

I.—HISTORIQUE DE LA CONFÉRENCE DE 1876.

Avant d'exposer les matières sur lesquelles ont porté les délibérations de la Conférence, il y a lieu de signaler la circonstance que la Grèce, non convoquée lors de la Conférence de 1874, représentée en 1875, mais dont le délégué n'avait pas signé la déclaration arrêtée à cette époque, a pris cette année une part relativement importante aux travaux de la Conférence.

Les Etats représentés étaient donc la Suisse, la Belgique, la Grèce, l'Italie et la France. Les noms des délégués des cinq Etats se trouvent consignés dans le texte même de la déclaration signée à Paris, le 3 février 1876. M. de Parien, qui a assisté à toutes les réunions monétaires depuis 1865, a été malheureusement empêché, par suite de circonstances de famille, de prendre part à nos travaux. M. Ruau, directeur de l'administration des monnaies et médailles de France, a, par contre, été appelé à diverses reprises au sein de la Conférence par son président M. Dumas.

Il a été tenu 7 séances, les 20, 21, 24, 25, et 29 janvier 1^{er} et 3 février 1876.

1. *Monnayage des divers Etats de l'Union pendant l'année 1875.*

Il résulte des tableaux présentés par les divers délégués et annexés aux procès-verbaux, que l'usage suivant a été fait, en ce qui concerne les pièces de 5 francs d'argent, auxquelles seules s'appliquent les restrictions édictées en 1875, de la latitude laissée à chaque Etat par la déclaration de 1875.

Frappes d'écus de 5 francs en 1875.

	Francs.
Suisse - - - - -	00,000,000
Belgique (en chiffres ronds) - - - - -	15,000,000
Italie " " - - - - -	50,000,000
France " " - - - - -	75,000,000
TOTAL - - - - -	Fr. 140,000,000

Il ressort de ce résumé que la Belgique, la France et l'Italie ont toutes trois fait usage de la faculté qui leur était laissée par l'article 2 de la déclaration du 5 février 1875, d'augmenter d'un quart leur contingent de fabrication de pièces de 5 francs d'argent. La Suisse seule s'est abstenue de toute frappe de pièces de 5 francs.

L'Italie a mis en circulation, dans le courant de l'année dernière, les 20 millions de pièces d'argent de 5 francs qu'elle avait reçu l'autorisation de frapper pour le fonds de réserve de la Banque nationale (art. 2 de la déclaration de 1874, et art. 4 de la déclaration de 1875).

Il n'est pas sans intérêt de fournir quelques renseignements sur les *monnayages d'or* pendant cette même année de 1875. Ils ont été très-importants, savoir :

	Francs.
Belgique (chiffres ronds) - - - - -	82,685,000
Italie - - - - -	2,244,440
France - - - - -	234,912,000
TOTAL - - - - -	Fr. 319,841,440

Le tout en pièces de 20 francs.

En 1874, il n'avait été monnayé dans les pays de l'Union que pour 90,666,120 francs d'or. Le chiffre de 1875, on le voit, est trois fois plus considérable que celui de l'année précédente. Nous reviendrons plus tard sur ces frappes d'or.

2. *Instructions des divers délégués.*

Le contingent de pièces de 5 francs d'argent arrêté en 1874 était de 120,000,000 pour les quatre Etats fondateurs de l'Union. En 1875, la faculté d'augmenter d'un quart les frappes d'argent avait porté ce contingent à 150,000,000 francs.

En

En 1876, et dès la première séance, les délégués de Belgique, France et Italie ont proposé de revenir au contingent de 120,000,000 francs, adopté en 1874.

Les délégués du Conseil fédéral ont, conformément à leurs instructions, réclamé :

1°. Une échelle limitative plus étroite que celle de 1874, et ont proposé un contingent de moitié plus faible (60 millions). (Voir procès-verbaux, p. 9.)

2°. Ils ont accentué la nécessité, vu la baisse continuelle de la valeur de l'argent, de sortir de la situation actuelle par l'adoption de l'étalon d'or unique.

La Belgique et l'Italie se sont au début montrées disposées à accepter une limitation plus étroite que celle de 1874 et à descendre au chiffre de 100 millions; mais cette réduction de 1/6, qualifiée de peu importante par les délégués de ces Etats, a rencontré un obstacle très-sérieux dans la demande de la Grèce, d'être autorisée à monnayer une quantité considérable de pièces de 5 francs.

Il importe d'entrer dans quelques détails au sujet de la situation monétaire de la Grèce; les soussignés en feront l'objet d'un chapitre spécial du présent rapport.

L'instruction n° 2 du Conseil fédéral, relative à la nécessité de sortir de la situation actuelle par l'établissement de l'étalon d'or, fera également l'objet de commentaires spéciaux lorsqu'il sera question des résultats de la Conférence de 1875.

3. Situation de la Grèce.

Le délégué du Gouvernement hellénique a exposé que la Grèce, entrée en 1868 dans l'Union dite latine, commençait seulement à pouvoir rendre son accession complète. Une loi devait déclarer obligatoire, à partir du 1^{er} janvier 1876, les paiements en monnaie de l'Union; le cabinet d'Athènes s'est vu dans la nécessité de surseoir jusqu'à nouvel ordre à l'exécution de cette mesure, pour éviter une crise que la brusque interdiction des monnaies actuellement répandues en Grèce aurait occasionnée.

La circulation intérieure de ce pays persistait à consister essentiellement en "zwanziger" d'Autriche, en écus de Marie-Thérèse, et en anciennes monnaies siciliennes. Le Gouvernement hellénique estime à 50 millions le total de cette circulation; 25 millions seraient en dépôt dans les banques, et le cabinet d'Athènes, sans demander actuellement le chiffre maximum de 50 millions, a réclamé le droit de faire frapper des pièces de 5 francs d'argent jusqu'à concurrence de 25 millions de francs.

La Grèce expose, à l'appui de sa demande, que sa situation diffère sensiblement de celle des Etats fondateurs de l'Union latine; ces derniers ont un stock d'argent monnayé considérable; la Grèce n'en a pas; il est donc équitable de lui attribuer le droit de se créer un stock en rapport avec sa population d'une part, et avec l'importance des monnayages d'argent effectués jusqu'à ce jour dans les autres Etats de l'Union. On ne saurait vouloir obliger le cabinet d'Athènes à ne frapper que des sommes minimales à titre de contingent annuel.

Ces prétentions de la Grèce ont été appuyées assez vivement par les délégués d'autres Etats; on a exposé, entre autres, qu'au point de vue politique, l'existence d'un grand nombre de pièces de 5 francs, frappées à l'effigie du souverain actuel de la Grèce, pourrait avoir son importance.

Les délégués suisses n'ont pas manqué de faire remarquer, comme M. Dumas l'avait déjà fait en 1875 (séance du 5 février, page 69 des procès-verbaux), que la Grèce pourrait, sans doute, se procurer par la voie du commerce la quantité de pièces de 5 francs qui lui paraîtrait nécessaire à ses besoins. Ils ont rappelé que en 1851, lorsque la Suisse a adopté le système monétaire français, elle s'est bornée à constater son accession par le monnayage de 100,000 pièces de 5 francs, et a laissé au commerce le soin de introduire dans le pays les grosses espèces qui lui étaient indispensables. La Suisse ne sent pas non plus sa conscience nationale affaiblie ou offensée par l'effigie de souverains étrangers sur les monnaies qui circulent dans le pays; enfin, au point de vue général de la politique monétaire suivie depuis un grand nombre d'années par la Suisse, les délégués du Conseil fédéral ont exprimé l'opinion qu'un monnayage d'argent aussi considérable ne paraissait pas admissible, dans un moment surtout où la baisse de l'argent s'accroissait toujours davantage.

FRANCE.

Il a été répondu, au nom du Gouvernement hellénique, que la balance du commerce de la Grèce soldant toujours par un déficit considérable au détriment de ce pays qui n'exporterait guère que les deux tiers de ce qu'il reçoit, il n'était pas possible d'introduire des espèces ou des écus par la voie du commerce.

Les délégués suisses ont aussitôt répliqué que, le déficit du bilan commercial de la Grèce ne pouvant être comblé que par du numéraire, les nouvelles monnaies que la Grèce demandait l'autorisation de frapper seraient rapidement exportées et viendraient ainsi encombrer la circulation des autres Etats de l'Union, déjà surchargée d'argent.

Les propositions de la Grèce ont été néanmoins accueillies favorablement par les délégués de tous les autres Etats, mais cependant pas dans la mesure réclamée par le Gouvernement hellénique.

Il a été proposé par la Belgique :

1°. D'accorder à la Grèce un total de 12 millions, à répartir comme suit :

	<i>Francs.</i>
a. à titre d'allocation extraordinaire, une somme de -	8,400,000
en pièces d'argent de 5 francs, pour remplacer les diverses monnaies actuellement en circulation.	
b. comme contingent proportionnel pour l'année 1876	3,600,000
TOTAL - - -	<u>Fr. 12.000,000</u>

2°. De prendre cette somme de 12,000,000 francs *en dedans* du chiffre du contingent commun de 12,000,000 francs, chiffre appuyé par la Belgique.

La Suisse se trouvait isolée, les autres Etats se montrant tous disposés à accorder à la Grèce un allocation exceptionnelle. En présence de cette situation, les soussignés se sont vus obligés d'adhérer à l'attribution à la Grèce d'un contingent exceptionnel de 8,400,000 francs, et d'un contingent de 3,600,000 francs pour 1876.

Les monnaies destinées au Gouvernement hellénique seront frappées en France, expédiées en Grèce, et devront être mises en circulation dans le pays, ainsi que cela s'est pratiqué jusqu'à ce jour pour les monnaies divisionnaires.

4. Question des bons de monnaie.

Les délégués des divers Etats ont annoncé qu'il avait été émis par leurs gouvernements des bons de monnaie pour l'année 1876, savoir : par la Belgique, la moitié de son contingent (procès-verbaux, page 8) ; par la Suisse, zéro ; par l'Italie, pour une somme inférieure à la moitié de son contingent (page 8 des procès-verbaux). Quant à la France, les soussignés avaient appris qu'elle avait donné des bons de monnaie, nonseulement pour la moitié de son contingent, mais qu'elle en avait même délivré au delà de l'année 1876, anticipant ainsi sur les résolutions à prendre par la Conférence.

Il est évident que l'article relatif aux bons de monnaie, qui figure dans les conventions additionnelles et qui autorise chaque Etat à émettre sur le compte de l'année prochaine, en bons de monnaie, la moitié du contingent de l'année précédente, préjuge les résolutions des conférences futures. Aussitôt qu'un Etat se trouve avoir émis au 31 décembre, en bons de monnaie, la moitié de son contingent passé, et peut-être davantage, il lui sera difficile de consentir, au mois de janvier, à une réduction notable de la limitation. Sa situation se trouve être entamée d'avance par les engagements qu'il a pris.

Aussi, l'un de nous a cru devoir émettre, dans la 4^e séance, a proposition de restreindre la faculté de l'émission de bons de monnaie de la moitié au tiers des contingents. La Conférence n'a pas consenti à s'associer à cette pensée. Par contre, le Conseil fédéral, au moment de donner son adhésion à l'échelle définitivement adoptée, nous a chargés d'exprimer à la Conférence ses regrets de ce qu'elle n'ait pas cru devoir réduire la faculté de l'émission des bons de monnaie.

L'opportunité de cette restriction a été démontrée, depuis la clôture de nos travaux, par les débats soulevés devant le Sénat français par M. de Parieu. (Voir l'exposé des motifs du projet de loi soumis par lui aux Chambres françaises pour proposer l'interdiction complète de l'émission de bons de monnaie.)

5. *Question du faux monnayage.*

Le Président de la Conférence, M. Dumas, a rendu compte, en termes remarquables, de l'existence de quantités considérables de fausses monnaies d'or. Comme les renseignements fournis par M. Dumas ont été quelque peu atténués dans les procès-verbaux de la Conférence, les soussignés croient devoir entrer à cet égard dans quelques détails.

Le faux monnayage en question s'opère en imitant les pièces d'or à l'aide du platine. La pesanteur spécifique de l'or est 19, celle du platine 21. La sonorité des deux métaux est à peu près la même. Il en résulte que, si l'on réussit à allier le platine avec un autre métal qui en amoindrit la densité, on peut obtenir les disques qui, lorsqu'ils sont dorés, imitent d'une manière assez parfaite les véritables monnaies d'or. Et comme le platine ne coûte que la cinquième partie de l'or, une fausse pièce de 20 francs faite à l'aide de ce métal revient à peu près à 4 francs.

Depuis plus de 6 ans, on a fabriqué de cette manière, en Espagne, sur une grande échelle, des isabellines, des napoléons, des souverains. Une certaine quantité de ces monnaies a été introduite en France, tant par le commerce des frontières que par les réfugiés carlistes. L'un de nous a eu l'occasion d'examiner déjà, en 1870, une collection de ces fausses monnaies. Une nouvelle collection ayant été exhibée dans la conférence de 1876, nous avons pu constater que les faussaires avaient fait des progrès très-considérables et que leurs derniers produits étaient propres à tromper le public.

M. Dumas a produit aussi un volumineux dossier d'informations judiciaires et autres, et signalé surtout les révélations faites au Procureur général de Paris, en août 1874, par un condamné détenu à la Roquette. Plusieurs ateliers se seraient montés, en 1867, en Catalogne, et il aurait été fabriqué, en fausses monnaies d'or espagnoles, jusqu'à concurrence du 1/15 de la circulation totale de la Péninsule. La méfiance publique s'étant éveillée, cette industrie coupable s'est portée sur les monnaies étrangères; les premières pièces françaises falsifiées auraient été introduites en France par le commerce des bestiaux. Les centres de fabrication seraient Valence et surtout Barcelone. Les ateliers seraient munis de presses hydrauliques avec lesquelles on estamperait sans bruit les "flans" de platine. Un seul atelier de Barcelone aurait fourni pour un million et demi de fausse monnaie; un autre aurait travaillé dans des proportions encore bien plus importantes. Les ateliers seraient très-bien montés et desservis par des mécaniciens et des graveurs habiles. Les lames de plateau seraient fabriquées sur divers points de l'Europe par des industriels dont l'adresse a été communiquée; ces lames, au dire du révélateur, auraient toutes 0^m,250 de longueur, 0^m,085 de largeur et 0^m,003 d'épaisseur.

Cette confession paraît être le résultat d'un sincère repentir du condamné, car tous les faits ont été confirmés plus tard tant par les tribunaux que par les consuls.

Nous avons dit qu'on modifie la densité du platine par l'addition de plusieurs métaux, de manière à reproduire exactement la densité de notre alliage monétaire de 9/10 d'or et 1/10 de cuivre, tout en conservant au disque exactement l'épaisseur légale, de façon à donner la longueur normale au rouleau de 1,000 francs. Les faussaires avaient débuté par un alliage de 950 de platine et 50 de cuivre (alliage des dentistes), ce qu'ils ont reconnu imparfait, parce que la hauteur du rouleau de 1,000 francs devenait trop petite; ils ont alors ajouté au platine et au cuivre un peu d'argent ou de zinc pour remédier à ce manque d'épaisseur.

Cette dernière circonstance constitue, au point de la justice pénale internationale, un indice accusateur important. Certains Etats hésiteraient cependant à poursuivre les fabricants de lames de platine, mais dès qu'il est prouvé que les industriels en question ne fabriquent pas des lames de platine quelconques, mais des lames ayant exactement la pesanteur spécifique de notre alliage monétaire de 9/10 d'or et de 1/10 de cuivre, l'intention coupable devient évident.

Il a été convenu que le gouvernement français communiquerait, à titre confidentiel, à ses alliés monétaires le dossier qu'il a réuni sur le faux monnayage, et que l'on adopterait, pour compléter l'article 11 de la convention de 1865, relatif à l'échange des communications sur les faits et documents monétaires, une stipulation ainsi conçue :

FRANCE.

“ Les gouvernements contractants se donneront réciproquement avis des faits qui parviendraient à leur connaissance, au sujet de l’altération et de la contre-façon de leurs monnaies d’or et d’argent dans les pays faisant ou non partie de l’Union monétaire, notamment en ce qui touche aux procédés employés, aux poursuites exercées et aux répressions obtenues. Ils se concerteront sur les mesures à prendre en commun pour prévenir les altérations et contrefaçons, les faire réprimer partout où elles se seraient produites et en empêcher le renouvellement.”

6. Déclarations de la Banque de France et de la Banque nationale de Belgique.

Lors de la première conférence, en 1874, la Banque de France, qui s’était refusée pendant un certain nombre de mois à recevoir les pièces de 5 francs italiennes et belges, a pris l’engagement, lorsqu’elle eut connaissance de la décision de la conférence de restreindre le monnayage de l’argent, de recevoir de nouveau ces pièces. Cette déclaration a été renouvelée en 1875. En 1876, il a été produit à la Conférence des lettres analogues de la Banque nationale de Belgique et de la Banque de France. Ces lettres, en date des 13 et 31 janvier, sont adressées aux ministres des finances respectifs et ont été annexées aux procès-verbaux (pages 52 et 89).

7. Résultats de la Conférence.

Les soussignés ont indiqué, sous chiffre 2, les instructions reçues par les délégués des divers Etats ; l’incident relatif à la Grèce a été développé sous chiffre 3 ; il reste à exposer quelle décision a été prise au sujet de la limitation du monnayage de l’argent pour 1876. Nous avons dit que nos alliés monétaires étaient d’accord au début pour revenir au chiffre de 120,000,000 fixé par la Conférence de 1874, tandis que les instructions du Conseil fédéral nous invitaient à réclamer une réduction plus considérable encore ; nous avons eu la satisfaction d’obtenir dans une certaine mesure un résultat favorable, en ce sens que l’échelle a été ramenée de 120 à 108 millions, la Grèce exceptée ; nous avons vivement insisté pour obtenir une réduction de 1/6 au moins, afin d’arriver au chiffre de 100 millions, mais nous nous sommes trouvés arrêtés par la déclaration unanime de nos collègues, que, si une entente n’intervenait pas sur les monnayages d’argent, chaque Etat reprendrait sa liberté complète. C’est donc à regret que nous avons dû accepter la situation qui nous était faite, et vous demander l’autorisation de souscrire à la répartition suivante :

	Francs.
Suisse - - - - -	7,200,000
Belgique - - - - -	10,800,000
France - - - - -	54,000,000
Italie - - - - -	36,000,000
	<hr/>
	108,000,000
A cette somme il faut ajouter le contingent	
annuel de la Grèce - - - - -	3,600,000
et le contingent exceptionnel - - - - -	8,400,000
	<hr/>
TOTAL - - - - -	Fr. 120,000,000

Une conférence qui sera tenue à Paris, dans le courant du mois de janvier 1877, s’occupera des mesures ultérieures à prendre.

Le Conseil fédéral nous avait, par son instruction n° 2, chargés de réclamer, non-seulement une réduction sur le contingent de 1874, mais aussi d’accentuer, en raison de la baisse continuelle de la valeur de l’argent, la nécessité de sortir de la situation actuelle par l’adoption de l’étalon d’or unique. Sur ce point, les délégués français ont émis l’opinion qu’il ne leur était pas possible de préjuger les vues ultérieures de leur gouvernement, en s’associant dès maintenant à une résolution fixant à une date déterminée la discussion de l’introduction de l’étalon d’or. Mais la conférence a admis, sur notre demande, l’insertion, comme annexe à ses procès-verbaux, d’une importante lettre adressée au Ministre français du commerce par la Chambre de commerce de Paris, pour réclamer avec instance l’adoption de l’étalon unique d’or. Cette pièce est, en raison de son importance, annexée à ce rapport sous la lettre A.

Il a été rappelé également qu'une Commission instituée en 1868-1869 par le Ministre des finances, après avoir consulté toutes les chambres de commerce, et après que la majorité d'entre elles se fut prononcée pour l'étalon d'or, avait conclu dans les termes suivants :

“ Pour établir en France, sans dépense pour le trésor, le régime complet de l'étalon unique d'or, il suffit de prendre les mesures suivantes : ‘ Modifier la Convention de 1865, d'accord avec les Etats qui y ont participé, et présenter en France une loi approbative de cette modification, qui interdise désormais ou limite étroitement la fabrication de la pièce de 5 francs en argent, en bornant au maximum de 100 francs le cours légal et obligatoire de celles qui existent aujourd'hui.’ ”

Il a été constaté enfin, dans les procès-verbaux, qu'au commencement de l'année 1870 la question monétaire a été soumise en France au conseil supérieur du commerce et de l'industrie, et qu'après une enquête longue et approfondie, la majorité de ce conseil s'est prononcée pour l'étalon unique d'or, comme l'avaient déjà fait les nombreux Etats réunis à Paris lors de la conférence monétaire internationale de 1867.

Si, d'une part, quelques gouvernements ont pu craindre d'apporter une certaine perturbation dans le commerce, en annonçant dès maintenant que la question de l'étalon d'or serait mise à l'ordre du jour de la prochaine conférence monétaire par une résolution explicite, les délégués suisses n'en croient pas moins avoir réussi à faire comprendre que cette discussion ne pouvait pas être ajournée indéfiniment. La baisse croissante de l'argent pendant toute l'année dernière, les déclarations faites par les délégués français et ceux des autres nations au cours de la conférence, comme aussi les événements survenus depuis la clôture de nos travaux, laissent place à l'espoir qu'une solution s'approche, et qu'elle est reconnue de plus en plus indispensable.

II.—ÉVÉNEMENTS MONÉTAIRES SURVENUS DANS DIVERS ÉTATS.

1. Pays-Bas.

Cet Etat avait l'étalon unique d'argent. Nous avons rendu compte, dans notre précédent rapport, des travaux législatifs des Chambres néerlandaises en vue de préparer l'introduction de l'étalon d'or. Depuis lors, une loi du 16 juin 1875 a prorogé jusqu'au 1^{er} janvier 1877 la suspension des frappes d'argent pour compte des particuliers. En même temps, on a introduit une nouvelle monnaie d'or légale, en pièces de 10 et 5 florins, à 9/10 de fin. Il y a donc actuellement en Hollande deux étalons *parallèles*, l'ancien étalon d'argent et le nouvel étalon d'or, mais avec interdiction pour les particuliers de monnayer de l'argent.

Au moment où nous écrivons, les journaux annoncent que la deuxième Chambre vient d'adopter une nouvelle loi rendant *exclusif* l'étalon d'or et plaçant l'argent au rang de monnaie divisionnaire et commerciale. Le Conseil d'Etat a été chargé en outre d'étudier l'introduction de l'étalon d'or dans les Indes néerlandaises.

2. Allemagne.

Les adversaires de l'étalon d'or unique attribuent une grande importance aux ventes d'argent faites par l'Allemagne pour passer de l'étalon unique d'argent à l'étalon unique d'or. Ils y voient une des causes essentielles de la baisse actuelle de l'argent, et en concluent que, lorsque la réforme monétaire allemande sera arrivée à son terme, l'argent remontera vraisemblablement à son prix antérieur ; pour nous servir d'autres expressions, ils considèrent que, la cause de la dépréciation étant momentanée, l'effet aura aussi une courte durée. Il est donc nécessaire de signaler le fait que les ventes d'argent faites par l'Allemagne jusqu'à présent sont considérablement moins importantes qu'on ne se l'était représenté. D'après les documents officiels communiqués par Soetbeer (*Deutsche Münzverfassung*, 3^{te} Abtheilung, p. 258), la somme totale de l'argent vendu jusqu'au 15 septembre 1875 est de 1,194,943 livres, soit 597,471.5 kilog. d'argent fin, qui au prix de 222 francs 22, répondant au rapport de 1 : 15 1/2, auraient produit une somme d'environ 133 millions de francs, mais sur laquelle l'empire a subi une forte perte. D'après le discours du député Sonnemann au Reichstag (page 250 *ibid.*), il resterait en Allemagne un solde d'argent de 700 millions de marcs, dont il faut déduire 270 millions à consacrer au monnayage des pièces divisionnaires. L'Allemagne n'aurait donc plus à jeter sur le marché monétaire que 430 millions de marcs, et M. Soetbeer, dont la compétence en ces matières est bien connue, ne considère pas ce chiffre comme exagéré. Quoi qu'il en soit du résultat final, on constate dans tous les cas que, jusqu'à l'automne dernier, l'Allemagne n'avait

FRANCE.

vendu que 600,000 kilog. d'argent fin. Or cette quantité, qui se répartit sur une période de deux ans, ne peut avoir eu une influence sensible sur la dépréciation de l'argent, et il importe dès lors de rechercher ailleurs les causes de celle-ci.

3. *Etats-Unis.*

Aux Etats-Unis, la loi du 12 février 1873 établit l'étalon d'or et une monnaie divisionnaire d'argent analogue à celle d'Angleterre. Une loi spéciale du 15 janvier 1875 a ordonné l'exécution de ces monnaies divisionnaires, pour le retrait des petites coupures de papier-monnaie, dont la circulation totale s'élève à 40,800,000 de dollars. Il résulte d'un message adressé le 17 février 1876 par M. Bristow, secrétaire des finances, au président de la Chambre des représentants, et d'un rapport de M. Linderman, directeur de la Monnaie des Etats-Unis, qu'on a acheté pendant l'année 1875, pour frapper ces monnaies divisionnaires, pour 9,390,446 dollars d'argent, soit près de 50 millions de francs. D'après des nouvelles plus récentes, les frappes ont atteint, en avril 1876, 15 millions de dollars, soit environ 75,000,000 de francs ('New-Yorker Handelszeitung,' 29 avril 1876). En sus de la quantité d'argent que l'exécution de la nouvelle loi exige pour les monnaies divisionnaires, il faut tenir compte de celle nécessaire à la fabrication des 'trade dollars.' Il se produit donc aux Etats-Unis des besoins d'argent propres à contrebalancer, dans une certaine mesure, les ventes opérées par l'Allemagne. Cette compensation fortuite, mais réelle, est un nouvel indice que les causes essentielles de la baisse de l'argent ne résident pas dans la réforme monétaire allemande.

4. *Russie.*

Nous avons signalé l'année dernière la tendance de cet empire, qui légalement a l'étalon double, de préparer l'avènement de l'étalon d'or. Il y a été fabriqué en effet de grandes quantités de monnaies d'or (12 1/2 millions de roubles en 1872, 15 millions en 1873), et relativement très-peu de monnaies d'argent (4 1/2 millions de roubles en 1872, 5.2 millions en 1873), et ces dernières seulement en pièces divisionnaires.

5. *Belgique.*

Le ministre des finances, M. Malou, vient de demander aux Chambres l'autorisation de proroger pour deux nouvelles années la défense de faire monnayer de l'argent pour le compte des particuliers.

6. *France.*

M. Léon Say, ministre des finances, a déposé, dans la séance du 21 mars, un projet de loi reproduisant en substance la loi belge relative à la faculté par l'Etat de limiter et de suspendre les monnayages d'argent pour le compte des particuliers. M. de Parieu a, le 29 du même mois, déposé au Sénat français un contre-projet demandant qu'il ne fut plus délivré de bons de monnaie pour la fabrication des pièces d'argent à 9/10 de fin. Le "Journal Officiel" français (n° du 16 avril, p. 758) publie le remarquable mémoire rédigé par M. de Parieu, à l'appui de sa proposition, qui a été renvoyée à l'examen d'une commission spéciale.

III.—SITUATION MONÉTAIRE ACTUELLE. PRODUCTION ET CONSOMMATION DE L'ARGENT.

Pendant le cours de l'année 1875, la baisse de l'argent, qui avait engagé, il y a plus de deux ans, le Conseil fédéral à réclamer, par note du 5 novembre 1873, la convocation d'une conférence monétaire, a continué à augmenter dans des proportions considérables. A aucune époque de l'histoire, l'argent n'a subi une pareille dépréciation.

La cote du marché anglais, en 1875, établit que le rapport commercial de l'argent vis-à-vis de l'or était, au mois de juin, de près de 1 : 17 (exactement 1 : 16,989), au lieu du rapport légal de 1 : 15.5. D'après les documents français, le même rapport s'est produit à Paris, au commencement de juillet, et le dernier exposé du directeur de la Monnaie des Etats-Unis fait connaître que, dans ce pays, le rapport des métaux était, au mois de novembre dernier, de 1 : 17. Au moment de l'ouverture de la conférence, la cote de Londres était de nouveau descendue au-dessous de 55 1/2 pence per once, ce qui équivalait à ce même rapport de 1 : 17.

Nous

Nous croyons devoir faire ressortir les baisses bien plus considérables encore survenues depuis la clôture de nos travaux.

La tâche des délégués appelés à représenter le conseil fédéral à la prochaine conférence sera de faire valoir les variations actuelles de la valeur de l'argent. On pourra mentionner, par exemple, qu'un jour, à Londres, l'argent a subi une baisse de 20 0/0, de sorte qu'une personne partie de Paris avec un sac de pièces de 5 francs d'argent ne possédait plus, en arrivant à Londres, qu'un sac de pièces de 4 francs. Il est vrai que, à côté de cette baisse exceptionnelle, les prix de l'argent se sont quelque peu relevés depuis un certain temps. Mais l'écart entre la valeur actuelle des deux métaux n'en reste pas moins très-considérable, car leur rapport commercial se rapproche actuellement de celui de 1 : 18, ainsi que le montrent les variations du prix de l'argent pendant les premiers mois de 1876. Nous allons examiner cette année, comme les précédentes, les causes de cette baisse, et essayer de faire comprendre quelle est leur importance relative, importance au sujet de laquelle les opinions, jusqu'à présent, ont été très-divergentes. Nous pouvons diviser tout ce que nous avons à dire à ce sujet sous les deux rubriques : Production et Consommation de l'argent.

1. *Production de l'argent.*

Il n'est parvenue à notre connaissance aucun fait qui indique un changement notable dans la production de l'argent au Mexique, dans l'Amérique du Sud, dans les pays européens, ou dans les autres contrées qui, avant 1860, fournissaient seules ce métal. On peut supposer cependant que l'état politique du Mexique n'a pas été favorable au travail des mines, tandis que la construction au Pérou d'un chemin de fers à travers les Andes, quoique fort loin d'être achevée, pour avoir raccourci la distance entre les mines et les ports, et favorisé le développement des mines ; quoi qu'il en soit, l'état de la production des anciennes provenances paraît être à peu près stationnaire. Tout l'intérêt de la question continue à se porter sur les mines de l'ouest des Etats-Unis. Leur richesse extraordinaire, la persistance de la production de la plupart des grands gisements, la découverte de nouveaux filons, l'ardeur fiévreuse avec laquelle travaillent les populations de ces contrées, les perfectionnements hors ligne, enfin, qu'on y apporte dans les procédés chimiques et mécaniques de l'extraction des minerais—continuent à faire de ces mines de l'Ouest le grand événement dans l'histoire moderne des métaux précieux. Le dernier rapport adressé par M. Rossiter W. Raymond, commissaire des Etats-Unis pour la statistique des mines, à la Chambre des représentants des Etats-Unis, évalue à 72,428,206 dollars la production des métaux précieux en 1874 aux Etats-Unis. M. J.-J. Valentine, surintendant de l'Express Company Wells-Fargo, évalue cette même production à 74,401,055 dollars. L'année 1873 dépassait déjà de 10 millions de dollars l'année précédente. En 1874, l'augmentation est de 2,200,000 dollars.

Quant à l'argent, il résulte de tableau de M. Wells-Fargo que sa production a été, en 1874, de 48,042,279 dollars, soit en chiffres ronds 240,000,000 francs. Nous nous sommes cependant convaincus récemment que ce chiffre de 48 millions de dollars, ainsi que celui de 44 donné pour l'année dernière, a besoin d'une réduction dont nous allons expliquer le sens : la compagnie Wells-Fargo ayant le monopole des expéditions à l'ouest des montagnes Rocheuses, les poids donnés par elle doivent être considérés comme ceux qui méritent le plus de confiance ; mais il faut tenir compte de la circonstance que les lingots expédiés sont loin d'être purs, que ceux d'or sont souvent argentifères, et que ceux d'argent surtout renferment quelquefois des portions notables d'or. Ainsi, le dernier rapport du directeur de la Monnaie nous apprend que les lingots sortant des mines de Comstock renferment un tiers à peu près de leur valeur en or, et qu'ils arrivent tels quels à San-Francisco pour y être affinés. Aussi ces lingots sont-ils désignés sous le nom de "bullion doré." Il faut donc, avec M. Linderman, déduire de la production de l'argent du Nevada le 1/3 à peu près au profit de l'or. En opérant cette réduction indiquée par M. Linderman, il reste, au lieu de 48 millions de dollars d'argent, une somme de 35 millions de dollars, soit en chiffres ronds 175 millions de francs, comme production totale d'argent aux Etats-Unis en 1874. C'est approximativement le chiffre indiqué par M. Linderman à notre consul général à Washington, dans une lettre mentionnée à la page 16 de notre rapport de l'année dernière. Nous ne possédons pas encore de renseignements officiels sur la production de 1875. Cette année et les suivantes auront cependant une importance capitale sur les destinées du métal argent, par suite de la découverte

FRANCE.

d'une "bonanza," c'est-à-dire d'une amas de minerai d'une richesse inouïe, découvert dans les profondeurs d'une exploitation bien connue à Comstock, et portant aujourd'hui le nom de "Consolidated Virginia and California Mine." Les plans de cette "Bonanza" ont été publiés dans un rapport remarquable adressé par le directeur des mines au ministre des finances des Etats-Unis, le 30 juin dernier. Il résulte de ce rapport et d'une lettre adressée par le professeur R.-E. Rogers (*Annual Report of the Director of the Mint*: Washington 1875, p. 83), que ces mines renfermaient, entre 1,500 et 1,600 pieds de profondeur, et sur une étendue de 225 pieds de longueur, un amas de minerai d'argent dont la valeur est généralement estimée à fr. 1,500,000,000, et à fr. 750,000,000 d'après le calcul le plus modéré, et cela à cette profondeur seulement. L'exploitation est entre les mains d'une compagnie riche, qui a introduit les immenses perfectionnements décrits à la page 17 de notre dernier rapport, en sorte que, toute nouvelle découverte de mines laissée de côté, les gisements Virginia et California viendront considérablement augmenter la production de l'argent pendant un certain nombre d'années.

2. Consommation de l'argent.

On sait que l'extrême Orient, et en particulier les Indes anglaises, avaient pendant un grand nombre d'années absorbé, et au delà, la quantité d'argent extraite des mines du monde entier. Depuis une dizaine d'années, cette absorption d'argent a considérablement diminué. D'une part, la construction des chemins de fer dans l'Inde anglaise est à peu près terminée, et cette colonie, au lieu de faire venir d'Europe des capitaux, est obligée de payer l'intérêt de ceux qu'elle a reçus; de l'autre, les envois de coton de l'Inde sont beaucoup moins importants que pendant la guerre d'Amérique. L'exportation d'autres produits a également diminué, et le bilan commercial en faveur des Indes s'est considérablement réduit. De plus, le solde de ce bilan, couvert autrefois exclusivement par des envois d'argent, est payé aujourd'hui par de l'argent, de l'or et des *India Council bills*. Ces derniers sont des mandats gouvernementaux sur les Indes, destinés à payer les dettes et redevances que nous avons mentionnées tout à l'heure. Nous avons donné l'année dernière une statistique détaillée sur le commerce des Indes et sur la couverture de son bilan. Nous répéterons seulement aujourd'hui que le résultat définitif des changements survenus se résume par les deux chiffres suivants: Pendant la période 1860-1866, la moyenne annuelle de l'exportation d'argent depuis l'Europe pour l'Egypte et l'Orient a été de 297 millions de francs en chiffres ronds. Cette même moyenne pour la période 1867-1873 a été de 101 millions de francs. Nous pouvons ajouter aujourd'hui que cette exportation, pendant l'année 1875, a été de £. 4,546,000, c'est-à-dire de 114 millions de francs environ. (*Economiste anglais*. Revue historique et commerciale de 1875, page 42.)

Cette altération énorme dans la puissance d'absorption que l'Orient avait eue autrefois par rapport à l'argent, et la dépréciation considérable de ce dernier métal qui en est résultée, ont produit enfin une baisse si grande du change sur les Indes, que le gouvernement anglais et le public commercial en ont été fortement émus. Une enquête parlementaire a été ouverte et suit son cours dans ce moment. Nous y puiserons sans doute quelques nouveaux éclaircissements, mais nous pouvons dire, dès aujourd'hui, qu'il y a, de par fait du commerce des Indes, comparativement à l'époque 1855-1866, une quantité d'argent de près de 200 millions de francs par an qui est rendue disponible et qui demande à être employée ailleurs.

D'un autre côté, nous avons vu que la production de ce métal s'est accrue de 175 millions, qui viennent également peser sur le marché. En présence de ces deux grands faits: diminution du pouvoir absorbant de l'Orient pour l'argent et production des mines de l'ouest des Etats-Unis, toutes les autres causes invoquées pour expliquer la baisse se réduisent à une importance relativement minime. En particulier, les ventes d'argent faites par l'Allemagne sont d'une importance très-secondaire en présence des deux chiffres que nous venons de faire ressortir. Ces ventes sont, dans le bilan monétaire du monde, compensées, dans une large mesure, par les achats d'argent ordonnés à Washington pour le monnayage des pièces divisionnaires. Enfin, les rapports de l'Europe avec les Indes nécessitent de moins en moins l'envoi d'argent dans cette colonie.

L'Union latine se trouve donc toujours plus en face de ce pressant problème de la diminution croissante de la valeur de l'argent. Les Etats de l'Union peuvent-ils rester dans cette situation de voir la valeur réelle et commerciale d'une

d'une notable portion de leurs monnaies s'amoindrir de jour en jour? Est-il possible de continuer à attribuer à 15 1/2 kilogrammes d'argent un pouvoir libérateur égal à celui de 1 kilogramme d'or, tandis qu'en plein marche on peut acheter avec ce dernier 17 1/2 kilogrammes de l'autre métal? A mesure que la baisse de l'argent s'accroît et que les causes de cette baisse sont reconnues ne pas être transitoires, la nécessité d'une solution dans le sens de l'étalon d'or unique s'impose de plus en plus. Le temps fait peu à peu son œuvre. Les esprits craintifs s'habituent à reconnaître la nécessité d'une réforme. Sans nous laisser entraîner par de trop vives espérances, il nous est permis d'entrevoir le moment où les Etats de l'Union latine examineront de plus près la transformation commandée par la logique, par la saine appréciation de faits économiques frappants et par l'histoire monétaire des pays à double étalon.

Comme signes précurseurs, nous pouvons faire ressortir la composition de l'encaisse de toutes les banques de l'Union latine. Partout où il est possible de s'en rendre compte, nous y voyons former des réserves d'or qu'on essaie d'immobiliser; partout on se débarrasse de préférence de l'argent. L'encaisse de la Banque de France, qui était au mois de mars de 495,000,000 de francs d'argent et de 1,325,000,000 d'or (discours du gouverneur, M. Rouland: *Journal officiel* du 22 mars 1876), prouve suffisamment que, malgré le langage prudent du conseil des régents, ce grand établissement administré avec tant de sagesse se prépare pour les événements à venir.

On nous objectera sans doute qu'une partie des maux qui ont été prédits en 1873 pour le cas du maintien du double étalon: la perturbation des changes à notre détriment, la hausse générale du prix des objets nécessaires à la vie, l'élévation de l'escompte, ne se sont pas produits. Il nous sera facile de répondre que, grâce à l'initiative prise par le Conseil fédéral, le régime du double étalon n'est plus intact depuis le mois de janvier 1874. Le monnayage de l'argent n'est plus libre. S'il a été restreint dans une mesure qui nous semble insuffisante, il n'en est pas moins certain que ces restrictions ont mis un terme, sinon absolu du moins sérieux, aux spéculations commencées en 1873 sur une grande échelle par une série de banques. En 1875, alors que la dépréciation de l'argent continuait à progresser, il s'est produit une augmentation importante du monnayage d'or. Cette augmentation ne serait jamais survenue, si les maisons qui font le commerce des métaux avaient eu la liberté de faire monnayer de l'argent.

Ces très-légères différences, momentanées du reste, dans le change sur Londres ont seules permis d'introduire de l'or à Paris, ou à Bruxelles. Si ces maisons avaient pu faire monnayer librement de l'argent, comme elles le peuvent pour l'or, il est évident que le grand bénéfice à réaliser les eût engagées à acheter de l'argent à Londres, et qu'ainsi notre circulation métallique eût été complètement altérée. Si notre or eût disparu pour satisfaire à ces besoins de la spéculation, alors se seraient produits la plupart des inconvénients redoutés. Aussi n'hésitons-nous pas à penser que les partisans du double étalon ne se rendent pas un compte suffisant des bénéfices résultant pour l'Union dite latine des restrictions apportées en 1874, 1875, et 1876 au monnayage de l'argent. Ces restrictions ont eu le triple avantage de nous préserver d'une inondation d'écus de 5 francs, de provoquer des monnayages d'or qui n'auraient pas eu lieu sans cela, enfin de défendre l'ancien réservoir d'or de l'Union latine contre l'exportation.

Tout les faits survenus depuis une année et consignés dans le présent rapport sont donc de nature à nous permettre de féliciter le Conseil fédéral de la politique monétaire qu'il a poursuivie avec persévérance depuis 1873. Nous regrettons que la dernière conférence monétaire n'ait pas accentué davantage les tendances de l'Union latine dans le sens de l'adoption de l'étalon d'or unique. Nous croyons néanmoins que les résultats consignés dans la déclaration de 3 février 1876 peuvent être considérées comme un progrès, et c'est dans cet esprit que nous nous permettons d'en recommander l'adoption à la haute assemblée fédérale.

En vous remerciant, monsieur le président et Messieurs, de l'appui que vous avez bien voulu nous accorder au cours des travaux de la Conférence, nous saisissons cette occasion pour vous renouveler l'assurance de notre profond respect.

Paris et Aarau, mai 1876.

Les Délégués suisses à la Conférence de 1876:

Kern.

Feer-Herzog.

FRANCE.

(Translation of the Extract from the *Journal Officiel* of 13th December 1876, inclosed in Lord Lyons' No. 310, Commercial, dated — December 1876.)

NOTICE.—For some months there has been in circulation in certain parts of France, and especially in Paris, a great number of foreign silver pieces, coming from Brazil and the South American Republics. These pieces, although of the same weight and dimension as the 5-franc piece, have no legal currency in France, and are, consequently, absolutely refused at the Treasuries and the Bank of France. The public ought, therefore, to be warned that if they accept these coins, they can only do so at their own risk. It should be remembered that the only foreign silver coins accepted at the public treasuries and the Bank are those of Belgium, Greece, Italy, and Switzerland.

Enclosure 3 in Lord Lyons' No. 30, Commercial, dated 19 January 1877.

The Directeur de l'Administration des Monnaies et Médailles to the Directeur du Mouvement Général des Fonds.

(No. 1,320.)

Administration des Monnaies et Médailles,
Paris, le 27—28 Décembre 1876.

M. le Directeur et cher Collègue,

J'ai l'honneur de vous adresser les renseignements complémentaires que j'ai pu réunir, pour répondre à la demande de S.E. l'Ambassadeur d'Angleterre que vous avez bien voulu me communiquer sous la date du 14 de ce mois.

Ces renseignements sont contenus dans 7 états, dont je donne ci-après le détail:—

- 1°. Production des usines métallurgiques d'après le compte-rendu de l'Administration des Mines.
- 2°. Poids des ouvrages d'or et d'argent présentés aux bureaux de garantie.
- 3°. Mouvement des métaux précieux à l'importation et à l'exportation pendant les 11 premiers mois de l'année 1876.
- 4°. Fabrication des monnaies françaises du 1 Janvier au 30 Septembre 1876.
- 5°. Législation spéciale au numéraire.
- 6°. Relevé mensuel des Encaisses de la Banque de France, de Janvier à Décembre 1876, avec la division entre l'or et l'argent.
- 7°. Relevé des monnaies d'or et d'argent fabriqués pour le compte de la Grèce, à la Monnaie de Paris.

La Grèce est le seul des 4 états étrangers faisant partie de l'Union créée par la Convention de 1865, qui ait fait frapper ses monnaies en France, en exécution d'un engagement qu'elle a pris, lorsqu'elle a accédé à cette convention. Pour les 3 autres états, l'Administration des Monnaies ne possède d'autres renseignements sur la fabrication et l'émission de leurs monnaies que ceux qui sont contenus dans les procès-verbaux des Conférences de 1874, 1875, et 1876, ou dans les documents publiés par le Gouvernement Belge, documents qui doivent être en la possession du Gouvernement Anglais.

En dehors de la fermeture du Change à Paris et à Bordeaux, l'Administration des Monnaies ne connaît aucune cause spéciale qui ait pu agir, en France, sur le prix du métal argent

(signed) Ruau.

Enclosure 13 in Lord Lyons' No. 30, Commercial, of 19th January 1877.

REPORT on Silver Currency, by the Hon. H. Prendergast Vereker, LL.D.

(Extract.)

British Consulate, Cherbourg,
17 October 1876.

Silver, like gold and all other medium of exchange, is subject to certain fluctuations, depending on demand and supply—gold only less than silver, because the standard values given to gold are calculated to obtain for it a value somewhat assured: and though, in some countries, the silver currency is preferred as the standard, yet, taking the world as the market for specie, those countries which prefer gold to silver as the medium of transactions are so much more influential than those which adopt silver, that the value of gold changes more equably and continuously than the value of silver; for the latter metal is not alone relatively dependent upon the price of gold, but, as a more marketable commodity, is subject in a greater degree to fluctuations, whether arising from extraneous influences, or from the excess of supply over demand, or *vice versa*.

Consequently, I presume that when the depreciation of silver is mentioned, what is really meant is the diminution of its value as compared with gold, and also the losses incurred in exchange from England, where gold is prevalent, to India, where silver is current: in order, therefore, to form correct views on this question, it is advisable to consider not merely the supply and demand of silver, but their relation to the supply and demand of gold.

There are two main causes at this moment directly acting on the silver market, and, as I think, calculated in time to counterpoise each other.

The first is the system inaugurated by Germany to draw in its silver currency and substitute it by gold. This has been for some time in operation, and the effect has been to lower considerably the price of silver; but when it is considered that the amount of silver required by England and India is about 50,000,000 ounces yearly, and that the whole amount which Germany can spare will probably not amount to 150,000,000 ounces, it is clear that the influence at most is a transitory one, and it can scarcely be supposed that the desire of Germany for a gold standard would induce her to throw off her silver at a considerable loss, when there is a good prospect of selling it profitably.

The effect of the financial measures of Germany has been the more immediately and severely felt, because applied to a silver market extremely sensitive and already overcharged, and because those measures were pushed on with undue haste at a time when there was no countervailing influence operating. It is, therefore, not surprising that the price of silver compared with gold should have been driven down on the London market some 10 per centum, and that an unreasoning panic should have supervened as to the probable future position of that metal; but it is notorious that in matters of finance the fear of an effect is often discounted more heavily than the reality, and a calm examination of what is occurring may remove some false impressions on this question.

In the past 9 months to 30th September, the excess of silver received in England from Germany amounted in value to 3,557,551 *l.*, and on balance Germany took from England 377,000 *l.* in gold; in the same period the imports of silver from China and Japan largely exceeded the exports to those countries, indicating that the Eastern markets were overcharged with that metal. Simultaneously with those movements, the imports of gold from the colonies were about 1,500,000 *l.* less than in the corresponding period of last year; the exports of bullion and specie to India in the same period are stated in the Custom House returns to have amounted to 4,250,000 *l.*; estimating that 75 per centum of this was silver, this implies the introduction to India in this latest period of 3,187,500 *l.* in silver.

The large amount of silver sent to India has a most important bearing on the question at issue; it was not merely to meet the exigencies of trade, but rather to liquidate loans and supply public requirements. Depreciation of silver had already been severely felt in the Indian market, thus proving a superabundance of that metal; and the large additional supply, exceeding by over 1,000,000 *l.* the amount sent in 1875, may have aggravated the tendency to depreciation. While thus the Indian market was overburthened, the condition of the home silver

FRANCE.

market was likewise with a downward tendency, for, exclusively of the usual sources of supply, it was weighted with an extraordinary and abnormal quantity of silver from Germany, China, Japan, and even France; so that, notwithstanding the large amount shipped to India, it had to bear in the 9 months the unexpected surplus of at least 1,400,000 *l.* of silver.

What I have stated seems sufficient to account for the unsatisfactory position of silver both in the London and Indian markets, with a diminished supply of available gold, and an excessive supply of silver from countries which have usually imported and not exported; and these events occurring within a short time, before counteracting tendencies had power to work, were calculated inevitably to depress the value of silver.

If the view is cast a little further back to the transactions of the year 1875, when anxiety commenced to be seriously felt as to the future position of silver, the data to be gathered will serve but to confirm the opinion above expressed. It is true that England imported about 5,000,000 *l.* more gold in 1875 than in 1874, but Germany in 1875 took 6,400,000 *l.* of gold, so that on this item alone there was 1,400,000 *l.* of gold withdrawn from England. Other countries had in the same period taken 1,600,000 *l.* more than they sent, so that there was an actual reduction in the available balances of gold amounting to 3,000,000 *l.* In 1875, likewise, the export of silver was 8,979,746 *l.*, that is to say, 3,232,211 *l.* less than in 1874, and, in fact, less than in any of the preceding 5 years; and though the imports of silver from the United States were about 2,000,000 *l.* less than in 1874, still a large unabsorbed balance remained to weigh down the British market, and consequently to depress the value of silver.

It is pleasing to turn from a contemplation somewhat discouraging to the counterpoising influence to which I alluded in the first instance: I mean the growing and imperative desire manifested in the United States to substitute for its greenback note currency gold or silver payments. The tendency is to adopt silver rather than gold, and this is manifested by the Act which has lately passed Congress to convert to silver dollars \$ 50,000,000 of greenbacks; and is further exemplified by the Bland Silver Bill, which deals more largely with the subject. There are many reasons which recommend this course to the United States; the present cheapness of silver is an incentive, and as the United States is the principal silver-producing country, it has a power in this respect which no other country possesses.

The energy and eminent practical action which the United States displays in financial arrangements is a guarantee that the conversion, once resolved upon, will not be unnecessarily delayed; but the measures taken would naturally be so regulated as not unduly to force up the price of silver, for, though those interested in silver mines would gain by such an operation, the bulk of the nation would lose. If, therefore, 5 years is adopted as the period in which the conversion may be effected, it appears that if the amount of greenbacks to be converted is \$ 250,000,000 (which, in the absence of positive statistics, I take as a moderate estimate), it would require \$ 50,000,000 yearly, on an average for 5 years, to accomplish the conversion. This is a full estimate of the produce of the United States mines; and it is clear that, if this amount of United States' silver, or an equivalent amount obtained from other countries, is required for absorption in the United States, a similar quantity will be taken from the general supply; and the English market especially will feel the effect of the stoppage of its principal supply, which would have the result of not only consuming in ordinary transactions the present superabundant stock, but, in all probability, of creating a scarcity and a demand which would indubitably force upwards the price of silver.

There are likewise various fluctuating influences, which, though affecting in ordinary years the value of silver in a greater or lesser degree, are, in their operation at the present time, of peculiar interest. The most important of these is the employment of silver in art manufactures, estimated to consume, on an average of late years, 10,000,000 ounces annually in the United States, and a larger quantity in the United Kingdom, besides smaller amounts in India, South America, Turkey, Asiatic and other countries. The advantage of using silver in such works is so universally recognised, that it may safely be assumed that, according as the market value of silver decreases, its employment otherwise than as a monetary medium will proportionately increase; consequently, this is a

cause

cause which, so far as it exerts influence, has the tendency to check any excessive lowering in the price of silver.

On the other hand, the adoption of paper currency, especially when notes are made a forced or legal tender, has the effect, so far as it operates, of cheapening silver, not relatively to notes, but relatively to gold, and mainly because, by inducing the withdrawal of a certain amount of silver previously employed in circulation, the quantity so withdrawn becomes essentially a marketable commodity, and goes to swell the floating stock overhanging the market. Upon this point the greenback issues of the United States, the forced note currencies of certain South American countries, and the paper moneys introduced in Italy, Austria, and now in Turkey, are all matters possessing very special interest, but calculations based thereon would exceed the proper limits of this report.

I have mentioned above the principal causes which, in my opinion, are affecting the value of silver, and in opposite directions; I am convinced that the aggregate result will be to raise the price of silver, I do not say to the high rate obtained in former years, but at least higher than the present price; and an examination of the transactions in the London (the chief) market will prove that this supposition is not made without sound foundation, and, it will be perceived that, whilst silver fell in value from the commencement of 1875, 10 per centum, 4 per centum of that fall has since been recovered; and whilst the supplies from Germany and the United States are lately diminishing, the general demand is, if not advancing, showing no symptoms of reduction.

In reference to the all important question of India, I would only venture to say one word. It appears to me that the introduction of a gold standard in India would be attended with very considerable difficulty, and it may be with very great loss, and I do not see that the result would compensate for the risk; even if silver were to become permanently depreciated in India, the various trades and interests concerned would gradually assimilate to the change, as has occurred in Europe subsequently to the influx and cheapness of gold, resulting from the unprecedented supplies of that metal; but my view is that the depreciation of silver will now, and for some years, be checked, and, consequently, that the existing evil should be treated as a temporary one; as, however, we cannot calculate upon what the unknown future may bring forth, it might be advisable tentatively, and gradually, to encourage the use of gold in India, and to habituate the natives to attach a fixed price and value to that metal. Were this adopted, it would give a power to deal with difficulties connected with the silver currency (should such unfortunately arise) which is not possessed at the present time.

In completing this report, I propose to offer a few observations on the monetary circumstances of this consular district, remarking that there is not here any important financial centre, nor any large transactions in specie; the imports (chiefly coals) are paid for in cash or bills, the exports (mainly of agricultural produce), almost wholly by bills, and the bills and cheques are usually negotiated in Paris, where the greater monetary transactions connected with this district are conducted.

Formerly 5-franc pieces used to be exported from this to England with profit, but no benefit is obtainable at the present prices and exchange, consequently this commerce has wholly ceased.

With regard to the existing circulation, judging from an experience of 6 months, and from the information I have been able to collect from bankers and others likely to be well acquainted with the subject, I should think that the use of Bank of France notes and 5-franc silver pieces is diminishing, whilst the use of 20-franc gold pieces is on the increase. Of small silver there is a sufficient, but by no means excessive, supply. Copper change is abundant.

The silver of the Latin Union, other than French, is entering more largely into circulation; this consists mostly of 1-franc and $\frac{1}{2}$ -franc pieces. Of these, the greater part are Italian, and next Belgian, which are numerous. Swiss pieces and those with the effigy of Pio IX. enter into circulation but in a small degree, and Spanish silver is very rarely seen. Altogether, these moneys, as compared with the French silver circulating, do not comprise more than 12 per centum.

H. P. Vereker.

FRANCE.

Enclosure 17, in Lord Lyons' No. 30, Commercial, dated 19th January 1877.

Consul *Marks* to Lord *Lyons*.

(Extract.)

British Consulate, Marseilles,
22 December 1876.

THE monetary requirements here are conveniently carried on through the medium of gold and silver currency, as well as bank notes, all three of which are now available in satisfactory proportions.

This place carries on some trade with India, but as it consists mostly of the importation of the oil seeds produced there, the question of the large recent depreciation of silver has not greatly affected this particular trade.

A few merchants and others here, who occasionally send out goods to India, are temporarily limiting their transactions, trusting to a speedy settlement of the exchange.

On consulting the best informed persons here, I glean that they are not apprehensive of any over production in the North American or other silver mines, and they fear no particular glut of that metal, having every confidence in the general absorption of silver in France, as well as in the other leading commercial nations.

They generally deprecate any legislation on the subject, particularly of a hasty sort; and they mostly believe that it would be desirable to leave the commercial world to develop its adaptability to altered or altering circumstances in connexion with the relative values of gold and silver.

There is a large quantity of Italian silver currency in circulation in this part of France. Four large smelting works here, last year, extracted 75,000 l. worth of silver from the lead and lead ore that had been sent here, chiefly from Spain, to be treated.

Edwd. W. Marks.

Enclosure 19, in Lord Lyons' No. 30, Commercial, dated 19th January 1877.

Report on the supply and Employment of Silver at Bordeaux.

(Extract.)

Bordeaux, 28 December 1876.

BORDEAUX is an importer and an exporter of specie, both gold and silver, and possesses the only local mint now open in France, but the district of its ordinary trade takes in no more than 18 out of the 86 departments, with about a fifth of the area, and a sixth of the population, of France.

To a small comparative extent it both supplies and employs silver, so far as its importation does the one, and its exportation, coinage, circulation, and manufactures do the other.

Although the current has changed in the year 1876, the amount of all specie imported at Bordeaux has increased enormously during the last preceding 3 years, at nearly 5 times the ratio of the rest of France. Taking the average of 2 years before and 2 years after the late war, and of the succeeding years 1874 and 1875, the increase has been 60 per cent. in the total of France, and nearly 300 per cent. at Bordeaux. The increase in the French importation of silver has been under 40 per cent.

The following are the particulars in millions of pounds sterling:—

	Amount Imported.		
	Bordeaux.	Total of France.	
	Gold and Silver.	Gold and Silver.	Silver only.
Yearly average for 1868, 1869, 1872, and 1873, Million £.	0.29	22.82	10.16
" " 1874 and 1875 " "	1.15	36.46	14.03
Increase per cent. - - - - -	294	60	37

In 1876, as compared with 1875, in which there was a decrease from the amount of 1874, the importation has fallen off on the whole trade of France; and this in a greater ratio as regards the total of specie than on the separate trade of Bordeaux. In the single article of silver, the falling off has been vastly greater at Bordeaux.

As shown by the following table, in the total of imported specie the rate of decrease has been about 2½ per cent. at Bordeaux, and nearly double for the whole of France. At Bordeaux the decrease on silver has been nearly 30, but in the total of France only 5½ per cent.

The estimate for 1876 is made on the importation of 10 months.

	Amount Imported.			
	At Bordeaux.		Total of France.	
	Gold and Silver.	Silver only.	Gold and Silver.	Silver only.
1875 Million £.	1.17	0.95	34.86	10.67
1876 „	0.95	0.56	27.66	6.63
Equal for the whole year to „	1.14	0.67	39.19	10.08
Decrease per cent. on the year	2.6	29.5	4.8	5.5

Of the average amounts annually imported in the last 2 years, about 8/10ths remained in the country.

	Gold and Silver.	Silver only.
The importation was Million £.	36.46	14.03
The exportation „	7.66	3.17
Leaving „	28.80	10.86
Or, per cent. of the importation	79	78

In 1876, so far as the year's trade has been published, the proportion remaining in the country has been greater in the total, but less in silver, the falling off in this metal having been over one-half in amount.

During 10 Months,—

	Gold and Silver.	Silver only.
The importation has been Million £.	27.66	8.40
The exportation „	4.87	2.22
Leaving „	22.79	6.18
A per cent. of the importation	83	74
Adding a proportionate sum for 2 months, the amounts left in the country will be for the year, in millions of pounds	27.49	8.42

England is, in ordinary times, the principal silver market for France, but she was displaced by the monetary operations of Germany after the war. In 1876, she would have recovered her position in this respect but for an extraordinary importation from extra-European countries, chiefly Chile.

With the estimate for 1876, the following have been the amounts of silver received

FRANCE.

received from England and other countries during 5 years, in millions of pounds.

	1872.	1873.	1874.	1875.	1876.
England - - - - Million £.	1.02	4.81	1.56	2.61	2.60
Northern Europe - - - - "	5.12	6.99	12.37	3.24	2.34
Southern Europe - - - - "	3.10	2.73	1.79	2.76	1.78
Other Countries - - - - "	0.40	1.02	1.65	2.06	3.36
Total - - - - "	9.64	15.55	17.37	10.67	10.08

I have been unable to find any trustworthy accounts from which to obtain, even by estimate, the employment of silver either in the Bordeaux district or in France generally. It is only at Paris that this information can be looked for with any success, the proper department of the Government having all the accessible means of stating what is the consumption of silver in the country.

No doubt, there is an important absorption by the hoarding disposition of the French peasantry, which can scarcely be estimated, just as there are large amounts brought into and carried out of the country by travellers at the land frontiers and by passengers arriving in the seaports.

The subject of the depreciation of silver is known to have occupied the attention of the French Government during the last 5 years, and to have been under the anxious consideration of the Chamber of Commerce at Paris, for their information, with reference to the adoption of gold as the standard of France.

So seriously had the old proportions of value between gold and silver changed, that the law of 5 August 1876 was passed, for the purpose of empowering the Government to suspend the coinage of 5-franc pieces for private individuals.

The report of this law pointed out the great fall that had taken place in the market price of silver and the profit that could be made on pieces passing for the value of 5 francs, coined out of silver purchased for $4\frac{1}{2}$.

It is with the same intention, to limit the silver money in circulation, that its coinage has been regulated in the Latin States (to which Greece has been added) by their Convention, under which it is stated authoritatively that their total coinage of 5-franc pieces in 1877 will not exceed 55,000,000 francs, one-half to be struck by France.

There can be no doubt, however, that in the country districts of France there is a want of silver money. This want is complained of in the Bordeaux district, but not more than in the other parts of the country.

Thomas Carew Hunt.

Lord Lyons to the Earl of Derby.

(Commercial, No. 34 of 1877.)

My Lord,

Paris, 22 January 1877.

I HAD yesterday the honour to receive your Lordship's Commercial Despatch, No. 16, of the 19th instant, informing me that the Secretary of State for India desired to be supplied with the earliest possible information as to the proceedings of the Monetary Conference to be held this month at Paris, between the 5 Powers forming the Latin Union.

It had, in fact, been intended that such a conference should be held in Paris this month, but the 5 Powers have now agreed that it shall be postponed until the end of the year.

The Duc Decazes told me this afternoon that it had been settled between the Powers to maintain, in the meantime, the existing stipulations respecting the coinage of silver.

I have, &c.

The Earl of Derby,
&c. &c. &c.

(signed) Lyons.

Enclosure in Lord Lyons' No. 74, Commercial, of 13th February 1877.

M. *Léon Say* to Lord *Lyons*.

Monsieur l'Ambassadeur,

Paris, le 12 Février 1877.

LA Conférence qui devait avoir lieu à Paris, au mois de Janvier dernier, entre les délégués des Etats Signataires de la Convention Monétaire de 1865 et de la Grèce, paraissant ajournée jusqu'à la fin de l'année, Votre Excellence a exprimé le désir de connaître le contingent de pièces d'argent de 5 francs que chacun des Etats pourra provisoirement faire frapper.

J'ai l'honneur d'informer Votre Excellence que l'art. 5 de la déclaration diplomatique du 3 Février 1876 renferme les dispositions auxquelles chacun des Etats de l'Union aura à se conformer. Aux termes de cet article, il ne sera délivré de bons de monnaie, pour l'année 1877, que pour une somme n'excédant pas la moitié des contingents fixés pour 1876.

En conséquence, les quantités de pièces d'argent de 5 francs qui pourront être fabriquées et émises jusqu'après la réunion de la Conférence sont limitées comme suit :—

	Fr.
France -	27,000,000
Belgique -	5,400,000
Italie -	18,000,000
Suisse -	3,600,000
Grèce -	1,800,000
Fr.	55,800,000

Il est bien entendu que ces contingents sont facultatifs, et qu'ils ne représentent que des maxima qu'on peut ne pas atteindre.

Veuillez agréer, Monsieur l'Ambassadeur, l'assurance de ma haute considération.

La Ministre des Finances,

Son Excellence, Lord Lyons,

Ambassadeur d'Angleterre.

Léon Say.

ALGERIA.

ALGERIA.

(Commercial, No. 5 of 1876.)

Lieutenant Colonel *R. L. Playfair* to the Earl of *Derby*.

(Extract.)

British Consulate General, Algiers,

20 October 1876.

As the legislation regarding silver coinage in Algeria is exactly the same as in France, there appears to be only one point requiring any remarks from me. In former years the Arabs and Kabyles were in the habit of hoarding considerable quantities of silver, and when, after the insurrection of 1871, they were called on to pay a war indemnity of 30,000,000 francs, they produced a large amount of silver money, much of which was in uncurrent coin, some as old as the time of Charles V. The Kabyles, who before that time were in the habit of using many silver ornaments, have lately taken to fabricating them in base metal, sometimes with a thin covering of silver, but as frequently without any attempt to conceal their true character.

It is believed that at the present time, when the natives wish to hoard money, they employ gold rather than silver, so that there cannot be said to be any exceptional drain on that metal amongst the natives of Algeria.

(signed) *R. L. Playfair*.

BELGIUM.

BELGIUM.

(Commercial, No. 68 of 1876.)

Mr. *Lumley* to the Earl of *Derby*.British Legation, Brussels,
2 December 1876.

My Lord,

On the 25th April 1876,* the Belgian Government proposed to prorogue, till the 1st January 1879, the law of the 18th December 1873, by which they were authorised to limit or suspend the coinage of 5-franc pieces.

By a further law of the 27th April 1875, this authorisation was limited to the 1st January 1877.

The Belgian Government now propose to substitute for that temporary prorogation a new law suspending the coinage of 5-franc pieces from the 1st January 1877.

The Committee of the Chamber of Deputies, to whom this proposition has been submitted, while agreeing to it, have modified the terms, by suggesting, as the formula in which the law should be submitted to the Chamber, that "from the 1st January 1877, no more pieces of 5 francs shall be coined in silver."

Should this be accepted, the coinage of silver thus interdicted could only be permitted afresh by a new law.

One of the members of the Committee suggested that, in order to arrive gradually at the standard of gold, it would be as well to limit payments in silver to the amount of 100 francs, which the Committee considered would not have the effect of discrediting the 5-franc pieces.

I have, &c.

The Right Hon. the Earl of Derby,
&c. &c. &c.(signed) *J. Savile Lumley*.

P.S.—Since writing the above I have seen M. Malou, who tells me he by no means desires to facilitate the introduction of the single standard of gold into Belgium, as suggested by the Committee, and that their proposition for limiting the legal tender of silver to payments of 100 francs would not only be prejudicial to Belgium, but even, if desirable, could not be effected without the consent of the other States parties to the Latin Monetary Union.

J. S. L.

(Commercial, No. 70 of 1876.)

Mr. *Lumley* to the Earl of *Derby*.British Legation, Brussels,
7 December 1876.

My Lord,

I HAVE the honour to inclose a report† of the discussion which took place yesterday in the Chamber of Representatives on the Bill suspending the coinage of 5-franc pieces.

M. Malou explained that the limitation or suspension of the silver coinage was merely a temporary measure, and was not to be looked upon as evidence of a change of system.

The question as to whether such a change were desirable would be decided in 1880, but up to that date no member of the Latin Union could separately adopt a change of the actual monetary régime, and M. Malou added that he considered the question of the adoption of the gold standard raised by the Committee to be premature; the Bill which the House is asked to vote does not, in fact, imply any change in the monetary system.

After a discussion on the inconvenience arising from the fact that, while the small

† "Independance Belge," 6 December 1876.

* See pp. 108-110 of Appendix to Report from the Select Committee on Depreciation of Silver (C. 338 of 1876).

small Belgian coins in nickel had no course in France, Belgium was flooded with French bronze coins, the Bill suspending the silver coinage was adopted by 80 votes to 1, with one abstention.

BELGIUM.

I have, &c.

The Right Hon. the Earl of Derby, (signed) *J. Savile Lumley.*
&c. &c. &c.

LIST OF DOCUMENTS ON THE MONETARY QUESTION, furnished by *M. Malou*,
Minister of Finance.

(A Set of these Documents is in the Library of the House of Commons,
and One in the India Office.)

NUMBER.	SUBJECT.
1st Series, Part 1	Netherlands.
„ 2	Belgium.
„ 3	Germany.
„ 4	France.
„ 5	Scandinavian Countries.
„ 6	General Statistics.
„ 7	Belgium Monetary Conference, 1873.
2nd Series, Part 1	Netherlands.
„ 2	Procès-verbaux of Monetary Conference of Latin Union, Paris, January 1874.
„ 3	Germany.
„ 4	Carrying out of the additional Monetary Convention of 31 January 1874, between Belgium, France, Italy, and Switzerland.
„ 5	Netherlands.
„ 6	England, United States, and Germany.
„ 7	Procès-verbaux of Monetary Conference of Latin Union, Paris, January—February 1875.
„ 8	Netherlands.
„ 9	Germany.
„ 10	Procès-verbaux of Monetary Conference of Latin Union, Paris, January—February 1876.
„ 11	Scandinavian Countries, France, Belgium, and Netherlands.
„ 12	France, Netherlands, and Spain.
3rd Series, Part 1	Report of English Committee on Depreciation of Silver.

S W I T Z E R L A N D .

SWITZERLAND.

(Commercial, No. 53 of 1876.)

Mr. Corbett to the Earl of *Derby*.

My Lord,

Berne, 29 November 1876.

WITH reference to your Lordship's circular (Commercial), of the 2nd September last, I regret that I can add little or nothing to the information conveyed to your Lordship in my Despatches,* Nos. 25 and 27 of this series, of the 16th and 19th April last respectively.

Switzerland coins neither gold nor 5-franc pieces, and depends entirely upon her neighbours, France and Italy, for all the currency of that description which is required.

In Switzerland at this moment silver has lost one-eighth per cent. of its value,

* Printed on pp. 112–113 of the Appendix to Report from the Select Committee on the Depreciation of Silver (C. 338 of 1876).

SWITZERLAND.

value, as compared with what is considered the par value as compared with gold.

The Swiss banks, though not unprovided with gold, are averse to making use of it in their payments. The banks in Italy and France acting in the same way, the Swiss banks are indisposed to give to those countries what is refused to them, and so contribute to increase the exportation of coin from Switzerland.

In point of fact, it may be said that Switzerland is obliged in this matter to follow the example of the neighbouring countries.

France, Belgium, Italy, and Switzerland, being bound by treaty not to coin annually more than a certain number of 5-franc pieces, it is clear that the large sales of silver made by the Government of the Empire of Germany since gold has become the legal standard in that country, have been out of proportion with the demands of the London market, and have produced a diminution in the value of silver.

The Earl of Derby,
&c. &c. &c.

I have, &c.
(signed) *Edwin Corbett.*

ITALY.I T A L Y.

Enclosure of Sir *A. Paget's* (No. 87, Commercial), of 29th December 1876.

Memorandum by Mr. *Compton*, Third Secretary to the British Embassy.

Rome, 20 December 1876.

IN the Report of the Select Committee appointed to consider the causes of the depreciation of the price of silver, it is remarked * that those statistics already furnished, to the end of 1873, are not very consistent, and a great difference between the French and Italian statistics is shown. It is well known in Italy that accurate statistics on the above question are not to be obtained, and those relating to the export and import of silver which are presented to the Chamber of Deputies, and which are considered the most reliable, are only drawn from reports from the Douanes and railway companies, and are in almost all cases merely presumptive with regard to details. The statistical system in France is far better carried out, and therefore their reports on the exportation and importation between the two countries are more to be trusted.

Since May last, when Mr. Macbean sent his report † through this Embassy, there have been no further statistics or details given on that part of the subject, and indeed those already collected are not of much value, as being only approximately correct, and not entirely to be depended upon. The only result that can be arrived at is that since 1866, when paper money was introduced in the place of coin, nearly 30,000,000 *l.* worth of silver has been exported, and but little remains except in the Treasury and banks.

Dated 27th Sept.
1876.

Her Majesty's Consul at Naples, in a report of which a copy is enclosed, states that the silver current in Southern Italy is limited to Sicilian dollars, and the silver coinage of the Latin Union. The former are used in payment of custom-house import duties. The Consul also remarks that no account is kept of the importation or exportation of silver, and adds that the movement is very unimportant. No further reports have been received from the consuls in Italy, except from Sicily, where no silver money is stated to be found.

Dated 1st Dec.
1876.

A treatise on the monetary question, as affecting Italy, has just been published by a gentleman belonging to the Ministry of Commerce and Agriculture, who

* Report from the Select Committee on Depreciation of Silver, pp. xli, xlii.

† Appendix to Report from the Select Committee on Depreciation of Silver, pp. 113-117.

who has made a study of the question. He has kindly given a copy of this work,* which is herewith transmitted.

ITALY.

In the Conference of the Latin Union of 1874, Italy was limited to the coining of 40,000,000 lire worth of 5-franc pieces, and another 20,000,000 lire for the National Bank as reserve-money. In 1875 Italy was limited to 50,000,000 worth of 5-franc pieces, and was allowed to circulate the 20,000,000 of reserve-money granted by the Conference of the year before.

At the Conference held this year, on the 3rd of February, Italy was limited to 36,000,000, and it is probable that at the Conference which is to be held shortly that sum will be lessened by at least one-half.

The following Table gives the Italian coinage, according to the Monetary Laws, from 1862 to 1875, inclusive :—

YEARS.	GOLD.	SILVER.		COPPER.	TOTAL.
		5-Franc Pieces.	Pieces of 20 and 50 Cents, and 1 and 2 Lire.		
	<i>Lire.</i>	<i>Lire.</i>	<i>Lire.</i>	<i>Lire.</i>	<i>Lire.</i>
1862 - - - -	28,608,760	964,485	330,960 50	28,190,442 54	58,094,598 04
1863 - - - -	76,514,100	-	31,751,913 20	8,000,000 00	116,266,013 20
1864 - - - -	82,172,600	601,935	30,696,351 10	- - -	43,470,886 10
1865 - - - -	68,705,190	4,010,835	41,937,106 80	- - -	114,653,131 80
1866 - - - -	3,926,020	2,351,760	33,501,070 60	20,000,000 00	59,778,850 60
1867 - - - -	5,525,830	-	16,530,145 80	41,293 20	22,097,269 00
1868 - - - -	6,807,940	-	1,252,452 00	19,958,706 80	28,019,098 80
1869 - - - -	3,707,100	19,976,230	- - -	- - -	23,683,330 00
1870 - - - -	1,095,400	30,729,280	- - -	- - -	31,824,680 00
1871 - - - -	470,160	35,116,695	- - -	- - -	35,586,855 00
1872 - - - -	66,100	35,611,920	- - -	- - -	35,678,020 00
1873 - - - -	20,404,140	42,273,935	- - -	- - -	62,678,075 00
1874 - - - -	5,919,420	60,000,000	- - -	- - -	65,919,420 00
1875 - - - -	2,244,440	50,000,000	- - -	- - -	52,244,440 00
TOTAL, 14 Years, 1862 to 1875 - <i>Lire</i> = £.	236,167,200 9,446,688	281,637,025 11,265,481	156,000,000 00 6,240,000	76,190,442 54 3,047,618	749,994,667 54 29,999,787

Up to the end of October in the present year the Italian coinage amounted to 1,404,100 lire of gold, and 29,721,840 lire of silver; total, 31,125,140 lire.†

It is to be noticed that when the Monetary Law of 1862 was discussed, it was ascertained that there was 312,000,000 lire of ancient money coined by the former Italian Governments in conformity with the decimal system, and, therefore, not subject to the conversion ordained by that law. This sum of 312,000,000 was divided into 232,500,000 of gold, and 79,500,000 of 5-franc pieces. To this was added, in 1870, about 6,000,000 of gold, and about 500,000 of 5-franc pieces, which the Pontifical Government had coined after 1860, in conformity with the system of the Union, and which were, therefore, exempt from conversion.

Since 1862, to the present day, the work of withdrawing from circulation the money of the Italian Governments not in conformity with the new monetary law has been actively pursued. The old coins have been withdrawn which circulated in Lombardy, Venetia, Modena, Parma, &c., and they will soon be entirely repressed, as is shown by the gradual decrease of the sums withdrawn in the last few years—namely, 38,000,000 in 1871, 34,000,000 in 1872, 21,500,000 in 1873, 22,000,000 in 1874, 14,000,000 in 1875. The value of this old coin withdrawn up to the end of 1875 amounted to 543,500,000 lire, of which about 486,500,000 was silver money, or “*eroso-miste*,” 28,500,000 gold money, and 28,500,000 copper money.

The money in circulation coined according to the present system—consisting of that emitted by the ancient Governments, and after 1860 by the Pontifical Government,

* “Legislazioni e Coniazioni Monetarie,” by A. Romanelli. Rome, 1st December 1876.

† The total here given is less than the items by 800.

ITALY.

Government, and of that coined by the present Government from 1862 to the end of 1875—gives a total of 474,500,000 of gold money, 361,000,000 of silver (5-franc pieces), besides 156,000,000 of smaller silver money, and 76,000,000 of copper money. There can be no doubt, however, that the greater part of this money has been melted again. It is to be added that, from the effect of the forced currency, the greater part of the Italian coin, both gold and silver, which has ever existed, has emigrated from this country, and scattered itself principally through the other States of the Latin Union. It is impossible to compute the amount of money in the hands of private persons in Italy, but it cannot be sufficiently great as to affect the question.

In the Treasury at the end of last October the following amounts were held:—

	<i>Lire.</i>
Gold - - - - -	16,533,100
Decimal silver - - - - -	14,796,800
Non-decimal ditto - - - - -	1,944,900
Gold and silver in the Treasury, committed to the National Bank -	5,563,100
	<hr/>
	38,837,900
And in copper - - - - -	3,500,000
	<hr/>

At the same time the 6 banks gave the following returns:—

	<i>Lire.</i>
Decimal gold - - - - -	71,924,219
Silver (5-franc pieces) - - - - -	46,503,946
Small silver money - - - - -	26,091,001
Gold and silver, non-decimal or in bullion - - - - -	1,110,239
	<hr/>
	145,629,405
	<hr/>

giving a total, with that in the Treasury, of about 188,000,000 of money, out of which (taking half the collective sums of gold and silver) the amount of silver can be approximately guessed as being between 92,000,000 and 93,000,000 lire, or between 3,500,000 *l* and 3,750,000 *l* sterling.

In the enclosed treatise, from which most of these details have been taken, it is stated that the united total of gold and silver coined by the 4 States composing the Latin Union up to the end of the year 1875—Greece being therefore excluded (from the year 1795 in France, from 1862 in Italy, from 1832 in Belgium, and from 1850 in Switzerland)—amounts to 8,602,846,880 lire of gold, and 5,766,779,250 lire of silver, to which sums must be added the 238,000,000 of gold and the 80,000,000 of silver (pieces of 5-francs) coined by the ancient Italian States according to the decimal system, and therefore not demonetised by the present State, making in round numbers a complete total of 8,841,000,000 lire in gold, and 5,847,000,000 lire in silver.

The following Table gives, from 1862 to 1875 inclusive, the amount coined each year by the 4 States, together:—

YEARS.	GOLD.	SILVER. (5-Franc Pieces.)
	<i>Lire.</i>	<i>Lire.</i>
1862 - - - - -	242,850,750	1,070,680
1863 - - - - -	286,744,740	108,435
1864 - - - - -	286,016,366	762,775
1865 - - - - -	251,114,085	9,033,305
1866 - - - - -	379,648,205	12,869,225
1867 - - - - -	230,931,480	87,254,280
1868 - - - - -	374,519,605	132,014,762
1869 - - - - -	262,582,770	142,921,833
1870 - - - - -	120,314,260	136,718,005
1871 - - - - -	95,819,480	63,744,770
1872 - - - - -	66,100	46,226,115
1873 - - - - -	20,404,140	308,779,525
1874 - - - - -	91,166,120	139,974,260
1875 - - - - -	319,841,500	139,904,705
	<hr/>	<hr/>
TOTAL, 14 Years, 1862 to 1875 - - - - -	2,962,019,600	1,221,382,075
	<hr/>	<hr/>
	<i>=£.</i> 118,480,784	48,855,283
	<hr/>	<hr/>

It seems more than probable that at the next Conference of the Latin Union the absolute suspension of the coining of silver (inclusive of that effected for the Governments) will be proposed, Switzerland being the most likely State to make the proposal. To this perhaps will be added another, that the legal currency of the coin should be limited, providing for the inevitable result of the withdrawal of all silver money which exceeds the demand. In the event of these proposals, the Italian interest would be not to wish for any *immediate* reforms which would conduce to the single gold standard, nor for delay until after the suppression of the forced currency, but rather for them to be effected simultaneously, and in harmony with the operations leading to this ultimate end.

Italy's objection against any immediate reforms for a single gold standard would be this. The greater part of Italian silver money, not only 5-franc pieces, but other smaller coin, has been replaced by paper money, and scattered in the other States of the Union. Therefore, when an immediate limitation of the forced currency of silver and the withdrawal of silver money exceeding the demand are agreed to, it is obvious that the other States of the Union would not wish, by reason of this overflow of Italian money, to be constrained to withdraw a greater quantity than their own, and to see in this way their losses increased. Also, Italy could no longer limit herself to the withdrawal of the excess of her silver money according to the presumable demand in the case of the circulation of coin being again re-established; but she would have to redeem almost all this money, submitting to a much more material loss, while her interest is to put into circulation only a part when the moment arrived to suppress the forced currency. The possibility of the introduction of counterfeit 5-franc pieces, which seems to be the great fear of the Union, would not be a sufficient reason for Italy to lay aside her interests, and submit to the losses which would be occasioned by any immediate measures. Nor would a delay in the reforms until after the forced currency is suppressed seem advantageous, as, among the greater dangers which might arise from the renewing of payments in coin, would be the demand of the holders of banknotes for change, when the banks could more easily defend their reserves by paying in silver instead of in gold. To avoid this danger, as well as all others which might result from the renewal of coin payments, steps must be taken beforehand for the efficacy of the operations, and an opportune moment must be chosen, instead of recourse being had to such artifices as would tend to oppose the change of banknotes. The example of Germany may be brought forward to show how a change in the monetary system may bring about grave results, and these results might be easily avoided if a country where paper money is in circulation should change its monetary system at the same time as it substitutes coin for the paper.

When Italy has in her power the means of initiating the redemption of her paper money, she ought above all to attempt to diminish the *mass*, and to promote in this way the cessation of the *agio*, by withdrawing no small quantity of the larger notes, because, if she began by the smaller, she would run the risk of the continuation of the *agio* not permitting coin to remain in circulation, and would produce the same want of the means of small exchange which was to be deplored in the first period of the forced currency. When a sufficient quantity of the larger notes is redeemed, and the *agio* is entirely done away with, it will then be the moment to redeem the smaller notes, and also to carry out the monetary reform, because the Italian silver money could then take the place of the paper redeemed, and there would be only that part to be withdrawn which would exceed the wants of the circulation of small coin.

This will be the attitude taken by Italy towards its allies, when they are inclined to introduce the reform before the above-mentioned contingencies are carried out; and the Union, as long as it exists, will be forced, however reluctantly, to agree to the wishes of Italy. The Convention of 1865 ceases to have force on the 1st of January 1880, if it should be denounced by any of the States. Therefore they may then injure Italy by denying all currency to her silver money; but since this money is and will remain in great quantity in their territory, until the smaller paper money is redeemed by her, by acting thus they would do greater injury to themselves.

The interests of Italy will therefore compel her to support any reform by which the Latin monetary system is based on the single gold standard; but it will be her duty to oppose anything that renders the carrying out of this more burdensome, and at the same time it depends exclusively on the skill of the

ITALY.

Government in choosing that moment for the carrying out of these measures which would be most favorable to the interests of Italy.

(signed) *W. M. Compton.*

Enclosure of Mr. *Compton's* Memorandum.

REPORT by Acting Consul *Barff* on the Question of Silver Currency in the Consular District of Naples.

Naples, 27 September 1876.

THE silver coinage current in the southern provinces is limited to Sicilian dollars and the silver coinage of the Latin Union.

Sicilian dollars, which under the Bourbon dynasty formed the circulating medium, have been very much reduced in quantity by exportation and melting over at the States' mint into francs and 5-franc pieces. Their only use at present is in payment of custom-house import duties, which are levied in specie, and can be paid either in gold or silver at the option of the importer. The Sicilian dollars have a nominal value of 4 francs 25 centimes, and vary in value from one-half per cent. under the value of gold to par, according to the quantity available and the demand. After encashment they are resold against gold or paper currency by the custom-house authorities, and repurchased by other buyers for the same object of paying duties.

The silver coinage of the Latin Union being on a par with gold, is used principally in small payments as a substitute for gold.

There is no account kept of the exportation or importation of silver coinage, but the movement is very unimportant. The quantity of silver coinage in the city and in the Neapolitan provinces is now very insignificant, as the peasants have now become accustomed to the paper currency, and the merchants are not called upon, as hitherto, to remit silver to the provinces for the purchase of produce.

(signed) *P. G. Barff.*

GREECE.G R E E C E.

Mr. *Stuart* to the Earl of *Derby*.

(Commercial, No. 53 of 1876.)

(Extract.)

Athens, 6 December 1876.

Dated 28th Nov
1876.

I HAVE the honour to enclose herewith a report, which has been drawn up by Mr. Consul *Merlin*, upon the Silver Currency of Greece, and upon the measures adopted by the Hellenic Government in consequence of the depreciation of silver.

As Mr. *Merlin*, besides being Her Majesty's Consul, holds the position of general manager of the Ionian Bank, the accuracy of his information respecting the currency may be relied upon.

(signed) *W. Stuart.*

Enclosure of Mr. *Stuart's* No. 53, Commercial.

REPORT on the Silver Currency of Greece.

The proportion of silver contained in the argentiferous lead, 10,000 tons of which is annually extracted from the ancient scoriæ at Sunium by the Laurium Company, being only about 1 per mille, and there being no gold mines in Greece,

Greece, this country may be considered almost unproductive, so far as the supply of the precious metals is concerned.

On the accession of King Otho to the throne of Greece, in 1833, a national currency was adopted on the basis of the double standard and the decimal system, the silver drachma being taken as the unit, the value of which was about $8\frac{1}{2}$ d. sterling.

The new coins, which, with the exception of the copper, were principally struck at Munich and Paris, were as follows, namely:—

<i>Gold.</i> —The double Otho, or 40-drachma piece.			
,, The Otho, or 20-drachma piece.			
<i>Silver.</i> —The 5-drachma piece.			
,,	The 1	,,	,,
,,	The $\frac{1}{2}$,,	,,
,,	The $\frac{1}{4}$,,	,,
<i>Copper.</i> —The 10-lepta piece.			
,,	The 5	,,	,,
,,	The 2	,,	,,
,,	The 1	,,	,,

For want of material, however, only about 40,000 l. worth of this money was coined during the whole of the reign of King Otho, the proportion struck in gold and silver being as follows:—

<i>Gold Coin</i> , consisting principally of 20-drachma pieces, to	£.
the value of about - - - - -	4,000
<i>Silver</i> , consisting of 5-, 1-, $\frac{1}{2}$ -, and $\frac{1}{4}$ -drachma pieces, to	
the value of about - - - - -	36,000
<hr/>	
Making a Total of - - - £.	40,000 sterling.

As this amount was totally insufficient for the requirements of trade and commerce, a Government monetary tariff was published in 1833, making almost all the gold and silver coins of Europe a legal tender in Greece, at a fixed rate, in drachmes and lepta, which was based on the intrinsic value of the various coins, according to an analysis made in Munich. When the Mexican and South American dollars began to supersede the Spanish pillar dollars in the Ionian Islands, they were likewise added to the coins contained in the Government tariff.

And, until the 1st (13th) August of the present year, the silver currency of Greece consisted almost entirely of Mexican and German dollars, with Swantzics and Greek copper for small coins.

The total amount of coin of all descriptions in circulation in Greece is not, however, large, and never probably exceeded 6,000,000 drachmes, or 214,286 l. sterling; the deficiency in metal being supplied by the notes of the National Bank of Greece, amounting to about 35,000,000 of drachmes (=1,250,000 l.), which constitute the real currency of this country, while those of the Ionian Bank, amounting to about 7,000,000 drachmes =250,000 l., form the principal circulation in the Ionian Islands.

In order to put an end to the confusion in accounts occasioned by the payment of debts in the coins of five or six different nationalities, and convinced that it was practically impossible for a small and poor country like Greece to have a currency of its own, Greece joined the Latin Monetary League in 1868. But for many years the assimilation of the currency to that of those States was annually adjourned.

The National Bank, however, at once commenced preparing for the change, by calling in its old notes, which were in drachmes, and substituting a new issue in their stead, in new drachmes, or francs. The bonds of all the new Greek Government loans were also issued in francs, and a new copper coinage was struck in Paris, and the old one called in. But, owing to an error of judgment, the new copper 10-centime and other pieces were prematurely issued at the same value as the old lepta-pieces, whereas they should have passed current for 12 per cent. more; and this error has since proved a very serious obstacle to the assimilation of the copper coinage to the franc, which latter coin now passes for

GREECE.

112 centimes in the new copper currency instead of 100, as it would otherwise have done if the silver and copper coins had been issued simultaneously.

Matters continued in this anomalous condition till last year (1875), when the public began to take alarm at the continuous depreciation in the value of silver, as compared with that of gold, and the consequent rise in the premium of foreign bills of exchange and gold coin in general.

* i.e., 5,000,000 francs worth.

In consequence of this agitation, a Committee, consisting of the principal Athenian bankers and financiers, was appointed by the Government, and several meetings were held at the Treasury, under the presidency of the Minister of Finance, in the spring of 1875. The result of their deliberations was to advise the State to hasten as soon as possible the assimilation of the currency to the French standard, and for this purpose to obtain permission to strike a larger quantity of silver 5-franc pieces than the one million* which had been accorded to Greece on her signing the Convention, together with 9,000,000 francs in billon or small coin, which the Financial Committee considered insufficient for the requirements of Greece and the Ionian Islands.

The Government likewise decided, on the recommendation of the Committee, to check the further importation of foreign silver coins by lowering the Government tariff for all silver money 3 per cent., with the exception of that of the States forming part of the Latin Monetary League.

On the meeting of the Chamber, however, in the autumn of 1875, the Bill proposing the assimilation of the currency to the franc on the 1st January 1876 was rejected, and the question was deferred *sine die*. In the meantime the Government, after great difficulty, had obtained the necessary permission to strike a further amount of 12,000,000 francs in 5-franc pieces, forming a total silver currency of 17,000,000 francs in 5-franc pieces, besides 9,000,000 francs in billon or small coin (consisting of 2-franc, 1-franc, $\frac{1}{2}$ -franc, $\frac{1}{4}$ -franc, and 30-centime pieces in silver), making together a total of 26,000,000 silver francs, which is the whole amount of silver coin allowed to Greece by the Latin League to the 1st of January 1877.

Greece is, however, of course permitted to coin any amount of gold she thinks proper.

For some months, namely, till the spring of the present year (1876), the depreciation of 3 per cent. in the tariff value of foreign silver coins in Greece had the desired effect of preventing any larger importation of either German or Mexican dollars into this country.

But a considerable further decline having taken place in the value of silver, which fell rapidly from 54 *d.* to 47 *d.* per ounce, a fresh panic ensued; and the Greek Minister of Finance was obliged to have again recourse to a Committee of Bankers and Financiers, and also consulted the various Chambers of Commerce in Greece as to the measures proper to be taken under these circumstances.

The Government having been unanimously urged to lose no time in adopting the French monetary system, a Royal Ordinance* was published, dated the 29th March (10th April), by which it was decreed that after the 1st (13th) August 1876 no silver coins, excepting those of the States belonging to the Latin Monetary Confederation, would be received at the public treasuries and custom-houses of Greece; and, in order to prevent any importation of foreign silver coins on a large scale in the interval, an import duty of 10 per cent. was levied on all silver coin, excepting that of the nations belonging to the Latin Monetary League, up to the 1st (13th) August, when the new currency was to be introduced.

Contrary, however, to all precedent in other countries, the Greek Government took no steps for supplying the wants of the public or the banks by an issue of the new coin, the onus of doing which it threw entirely on the National and Ionian Banks, to which latter permission was reluctantly accorded to convert the specie it held into francs, by sending it to the Paris Mint, to be there coined into the new 5-franc pieces (Greek pattern), on condition that, if there was any profit on the transaction, it should be paid to the Greek Government, while the loss, if any, was to be borne by the bank.

With

* Printed on pp. 119, 120 of Appendix to Report from the Select Committee on Depreciation of Silver (C. 338 of 1876)

With these onerous conditions the banks, which held almost the whole of the specie in the country, were fain to comply, and on the 1st (13th) August last both the National and Ionian Banks commenced paying their notes and obligations in the new currency.

The following is a statement of the quantity of the new coinage struck at Paris by the banks, with the permission of the Greek Government, up to the present time :—

Amount Coined by the National Bank of Greece.

						Francs.
GOLD,	35	pieces of 100 francs	-	-	-	3,500
"	161	" 50	"	-	-	8,050
"	36,851	" 20	"	-	-	737,020
"	18,927	" 10	"	-	-	189,270
"	9,256	" 5	"	-	-	46,280
In GOLD						984,020
SILVER,	1,839,000	pieces of 5 francs	-	-	-	9,195,000
"		Small coin (Billon), 886,850 pieces of 2 francs	-	-	-	1,773,700
"		" 4,531,358 " 1 franc	-	-	-	4,531,358
"		" 4,500,633 " ½ "	-	-	-	2,250,316.50
"		" 2,223,127 " 20 centimes	-	-	-	444,625.40
In SILVER						18,194,999.90

Amount Coined by the Ionian Bank.

GOLD	-	-	-	-	-	Nil.
SILVER,	970,000	pieces of 5 francs	-	-	-	4,850,000

Total Amount Coined by both Banks.

GOLD	-	-	-	-	-	984,020
SILVER	-	-	-	-	-	23,044,999.90
Total GOLD and SILVER						24,029,019.90

Greece has thus availed herself of the permission to coin nearly the whole of the silver currency allowed her by the Latin Monetary League, with the exception of 699,000 pieces of 5 francs. But although this country has thus practically adopted the system of the Latin Monetary League, and only the new coin passes current, the old drachma is still retained by the Government and public in general as the money of account, and some time may probably yet elapse before this is changed.

The National and Ionian Banks, in order to maintain their note circulation, will naturally endeavour to keep a sufficient quantity of 5-franc pieces in their safes to meet any demand on them for specie, as, in a thinly populated and poor country like Greece, with a large circulation of banknotes, a gold currency can with difficulty be maintained by the banks.

Owing to specie payments being suspended in the United States of America, France, Italy, Austria, and Russia, in which countries small banknotes, with a forced currency, are made to supply the place of silver coin, coupled with the demonetisation of silver in Germany happening at a moment when the trade of China and the East Indies was paralysed, and the yield of the silver mines in Nevada, &c. unusually large, an unprecedented fall has taken place in the value of silver as compared with that of gold.

But it is to be feared any theory formed from these data, that the present low price of silver will continue to be maintained, or that the single standard should be therefore adopted by all nations, would probably prove ruinous and fallacious in the extreme, from the insufficiency of the supply of gold alone to meet the exigencies and requirements of the trade of the world.

C. L. W. Merlin.

British Consulate, The Piræus,
28 November 1876.

NETHERLANDS.

NETHERLANDS.

(Commercial, No. 62 of 1876.)

Sir *E. Harris* to the Earl of *Derby*.

(Extract.)

The Hague, 17 October 1876.

Enclosure, No. 1.

I HAVE the honour to transmit herewith the translation of a Memorandum which has been courteously supplied to me, at my request, by the Netherlands Government, describing the course of events during the last couple of years with reference to the monetary question in this country, as well as the several steps taken by the Government in view of the difficult and threatening situation created by the existence, in the Netherlands and her Colonies, of an exclusive silver standard currency, in the face of a continuous fall in the value of bar silver, and the adoption of the gold standard in the neighbouring Empire of Germany; the culminating measure resolved on by the Netherlands Government in this state of things having been the presentation to the Second Chamber of the States-General, in the month of June last, of 2 Bills, having respectively for their object the substitution of the gold for the existing silver standard in the Netherlands, and the establishment of the double (or gold and silver standard) in the Dutch possessions in the East Indies.

Of those 2 Bills, as well as of the explanatory statement with which they were accompanied when laid before the Chamber, I had the honour to transmit translations to your Lordship in my Despatches, Nos. 55 and 64, of the 7th and 22nd of June last respectively.

Those Bills are still under consideration in the Committees of the Second Chamber to which they were referred, and they will not come on for discussion in the Chamber itself for some little time yet; but a decision on the important subject to which they relate must be arrived at before the 1st of January next, for (as I had the honour to report to your Lordship in my Despatch,* No. 34, Commercial, of the 12th of April last) the Law of the 1st of July 1875, which authorised the coinage of gold pieces, but left silver as the standard of the national currency, was passed by the States-General only as a temporary measure, and with the proviso that it should be revised before the close of the current year.

I have the honour further to enclose, as supplementary to the information contained in the Memorandum transmitted herewith, the following returns, all of which have been derived from official sources:—

Enclosure, No. 2.

1. Return of the total quantity of gold and silver imported into, and exported from, the Netherlands during each of the 6 years ended 31st December 1875.

Enclosure, No. 3.

2. Statement of the total quantity of coin and bullion held by the Bank of the Netherlands at the commencement of each month from May 1875 to May 1876.

Enclosure, No. 4.

3. Statement of the total quantity of gold and silver coined at the Netherlands Mint between the year 1840 and the end of May 1876.

E. A. J. Harris.

* See page 128 of Appendix to Report from the Select Committee on Depreciation of Silver (C. 339 of 1876).

Enclosure 1 of Despatch from Sir *Edward Harris*, No. 62, Commercial, dated 17 October 1876.

Memorandum of Netherlands Finance Minister on Monetary Question.

(Translation.)

The Hague, 4 September 1876.

So long as the Netherlands, Germany, and the Scandinavian kingdoms had the exclusive silver standard in common, and the double standard was also retained by the Latin Monetary Union, we had not the smallest inducement to think of any change in the excellently devised monetary system established by the Act dated 26th November 1847.

An important change was, however, introduced into this position by the Act promulgated in December 1871 in the German Empire, by which it was ordered that a gold coinage should be struck, and the coinage of the larger silver money should be discontinued, and that the Government should be at liberty to withdraw the larger current silver money from circulation; and in the explanation appended to the Act, it was, at the same time, indicated that it was intended, at a subsequent period, to introduce the exclusive gold standard into Germany. And, besides, after the year 1870, France, and for a long period Italy (the two principal States of the Latin Monetary Union), had, to a great extent, replaced the metallic currency by the circulation of inconvertible paper-money.

The fear was not unreasonable that these measures might have an injurious influence on countries which retained the exclusive silver standard, and they, therefore, attracted a good deal of attention in the neighbouring States in which that system was adopted.

When the extensive coinage of gold money in Germany confirmed the anticipation that a step would soon be taken in that country in the direction of the exclusive gold standard, the expectation that France would soon restore the metallic currency was not realised, and in the northern kingdoms the idea of the exclusive gold standard gained ground more and more, the then-existing Government resolved to appoint a Government Commission to examine the subject. This was done on 30th October 1872.

Their Report, dated 28th December following, proposed, in view of the uncertainty which still existed in the above-named countries, that the Netherlands should adopt the gold standard provisionally, while retaining the silver standard, with the relative value, as between the two, of 15.5 to 1—power being reserved to the Government to restrict temporarily, or suspend altogether, the coining of one of the two kinds of metal. The Commission, at the same time, expressed the opinion that it was unnecessary to take any steps with respect to the currency of Netherlands India.

A Bill drawn up in this sense had been already presented to the King, when the Government learnt that a Bill had, meanwhile, been brought forward in the German Federal Council for the further regulation of the monetary system, tending to the adoption of the gold standard *exclusively*.

As the sphere in which the double standard obtained was much diminished by such measures, and the adoption of the *double* standard was at that moment, therefore, impossible, the question arose whether we should retain the *silver* or adopt the *gold* standard.

The question was too important to be settled without mature consideration. The Government deemed it safer, also, while waiting for a further expression of opinion from the above-named Government Commission, not to prejudge the question, and confined itself, at that time, to proposing a measure of precaution—namely, to empower the Executive to suspend the coinage of silver for private persons.

A Bill to this intent, by which the authorisation was granted till 1st November 1873 at the latest, was accepted by the Legislature, and passed into a law by the Act dated 21st May 1873, while as early as 27th May following the Executive made use of this authorisation, and pronounced a suspension till 1st August 1873.

In the meantime the Government Commission already mentioned, after having examined what had taken place in Germany connected with this subject, and more particularly the proposal to adopt in that country the exclusive gold

NETHERLANDS.

standard, had issued another Report, dated 26th June 1873, the tendency of which, as was indeed to be expected, was—as now, together with Germany, the Scandinavian kingdoms had definitely resolved on adopting the exclusive gold standard—to adopt that system in this country also. With respect to Netherlands India, on the other hand, they thought it desirable to retain the silver standard.

The Commission, however, recommended, at the same time, very *great* changes in the silver small coinage, and the substitution of bronze for copper money. A decision on that question, from the nature of the subject, could not be taken in time before the expiration of the above-mentioned date for the suspension of the coinage of silver money, namely, before 1st November 1873, which was ordered by the Royal Decree dated 19th July 1873.

While, therefore, the recommendations of the Government Commission were still under consideration, the Government made, as precautionary measures, the same proposals as had been already approved in May 1873, relating to the suspension of the authorisation to coin silver for private persons. The Head of the State made immediate use of the authorisation conferred by the Act of 26th October 1873, and the coinage was suspended, by decree dated 26th October, till 1st February 1874.

Meanwhile the Government had been engaged in considering the above-mentioned recommendations of the Commission—namely, for the introduction of the *exclusive gold standard* in this country, and the retention of the *silver* standard in Netherlands India.

The Government Bill, dated 28th October 1873, which was completely in accordance with the above, proposed that gold should be adopted as the exclusive standard, and that silver should be used for small change, while it proposed no alteration of the monetary system of Netherlands India.

The chief grounds on which this proposal for altering the monetary system rested were that silver would undergo not only a very considerable continuous depreciation, but would be subject also, in the long run, to greater fluctuations in value than formerly; and that, in consequence, our rates of exchange with countries in which gold is the basis of the monetary system would rise considerably, and undergo besides continual and important variations. After long discussions, however, the main principle of the Bill was rejected by the Second Chamber of the States-General in March 1874, and the Bill was consequently withdrawn by the Government.

After this expression of opinion on the part of the Second Chamber, the then-existing Government did not feel itself justified, on its side, in taking measures to continue the suspension of coining for private persons, which, in the meanwhile, by decree dated 15th January 1874, had been prolonged till 1st May (the longest limit appointed by the Act dated 26th October 1873).

The consequence of this was that the reopening of the Mint was eagerly turned to account (the price of silver, which on 1st May was still 59 pence, had fallen on 1st October following as low as 57½ d.).

The undersigned found this subject in this state at the period above named.

He was afraid that if the Mint remained open, and the then already very great depreciation of silver continued, that depreciation would extend, in a greater or lesser degree, to the currency; while, if ever the exclusive gold standard were adopted, the cost of such a measure, arising from the exchange of all the coined silver, would be very considerably augmented. On his proposal, therefore, a Bill, dated 7th October 1874, was presented to the Second Chamber of the States-General, having for its object to confer power on the Government to *suspend* or *restrict* the above-mentioned coining for private persons till 1st January 1876.

This Bill (the authorisation to restrict was omitted) passed into a law by an Act dated 3rd December 1874, with this alteration, that the term was shortened to 1st July 1875, as a stimulus to the Government to bring the subject again, as soon as possible, forward for discussion in the Chamber.

By a Royal decree, dated 11th December 1874, the authorisation to suspend was made use of till 1st April 1875, and by a Royal decree, dated 6th March 1875, until the above-named latest date, 1st July 1875.

The Government did not remain in the meantime inactive, and the trading community also began to urgently demand further provisions, inasmuch as, now neither gold nor silver could be coined, the rates of exchange were extremely
uncertain,

uncertain, and had fallen at this time to an unprecedentedly low point (bills of exchange on London, at short dates, stood at 11·68 florins per 1 l.).

A Bill, dated 18th April 1875, was presented to the Second Chamber of the States-General, with the view, while retaining the silver standard, to adopt gold, *i.e.*, both the 10-guilder and the 5-guilder piece, as standard coin, a proviso being added that this Act should be revised before January 1877. The ratio of gold to silver was also accepted at 15·625 to 1.

This Bill was (except as regards the proposal to adopt the gold 5-guilder piece) passed into a law, dated 6th June 1875.

From the Despatch* of Sir Edward Harris, dated 12th April 1876, sent to the Earl of Derby, it appears that the English Government is aware of the passing of the Act last mentioned.

The history of the progress of affairs must, however, be carried on by recording the presenting, on 9th May and on 1st June respectively of the present year, of certain proposals for regulating as well the Netherlands as the Indian monetary system, and the preliminary report, dated 13th July, issued by the Second Chamber of the States-General.

A copy of all the documents referring to the subject is annexed, with the intention of placing it in the hands of the British Minister at the Hague.

The purport of these proposals is —

For the Netherlands.

The introduction of the exclusive gold standard, withdrawing or converting the larger silver coins into small money, replacing copper money by bronze, at the same time revising a number of administrative regulations with regard to the monetary system, one and all to come into force on 1st January 1877; further, to authorise the Minister of Finance to sell silver, and to act upon this authorisation at once.

For India.

The introduction of gold as standard money, besides the present silver standard coins, suspension in coining silver standard money, and authorising the Governor General, if necessary, to cause to be sold silver coins after withdrawing them from circulation.

The Second Chamber, &c.

(signed) *Van der Heim,*
Minister of Finance.

Enclosure 2 of Despatch from Sir *Edward Harris*, No. 62, Commercial, dated 17 October 1876.

RETURN of GOLD and SILVER BULLION and COIN Imported into and Exported from *Holland* during the Six Years from 1870 to 1875, inclusive.

1870.

IMPORTED.

	Value in Dutch Florins.†	Fl.
Gold and Silver Bullion	32,168,865	{ whereof - 26,621,328 from Great Britain. " - 4,249,430 " Belgium. " - 1,295,927 " Germany.
Gold and Silver Coin	9,492,773	{ whereof - 7,593,700 " Great Britain. " - 1,744,285 " Germany.
Total Imported in 1870. - Fl.	41,661,638, equal to 3,471,803 l. sterling.‡	

* No. 34, Commercial, printed on page 128 of the Appendix to Report from the Select Committee on Depreciation of Silver.

† In the Customs Returns, from which this statement is compiled, the value of gold bullion is computed at 1,200 florins per kilogram, that of the gold coin at 1,400 florins per kilogram; the silver bullion at 80 florins per kilogram, and the silver coin at 96 florins per kilogram.

‡ Calculated at the usual rate of 12 florins to the pound sterling.

PAPERS RELATING TO SILVER.

NETHERLANDS.

EXPORTED.

	<i>Fl.</i>	<i>Fl.</i>
Gold and Silver Bullion - - -	4,510,340	{ whereof - 4,170,000 to Belgium. " - 220,340 " Germany. " - 120,000 " Great Britain.
Gold and Silver Coin - - -	12,885,866	{ whereof - 8,606,200 " Java " - 2,501,350 " Belgium. " - 1,748,676 " Germany.
Total Exported in 1870 - <i>Fl.</i>	17,396,206	equal to 1,449,684 <i>l.</i> sterling.

1871.

IMPORTED.

	<i>Fl.</i>	<i>Fl.</i>
Gold and Silver Bullion - - -	28,285,295	{ whereof - 18,802,344 from Great Britain. " - 8,853,756 " Belgium. " - 1,112,055 " Germany.
Gold and Silver Coin - - -	11,691,088	{ whereof - 8,026,556 " Belgium. " - 2,801,517 " Great Britain. " - 868,923 " Germany.
Total Imported in 1871 - <i>Fl.</i>	39,976,383	equal to 3,331,383 <i>l.</i> sterling.

EXPORTED.

	<i>Fl.</i>	<i>Fl.</i>
Gold and Silver Bullion - - -	132,625	{ whereof - 120,000 to Great Britain. " - 12,225 " Germany.
Gold and Silver Coin - - -	6,818,090	whereof - 6,724,800 " Java.
Total Exported in 1871 - <i>Fl.</i>	6,950,715	equal to 579,226 <i>l.</i> sterling.

1872.

IMPORTED.

	<i>Fl.</i>	<i>Fl.</i>
Gold and Silver Bullion - - -	5,032,443	{ whereof - 2,726,400 from Great Britain. " - 1,358,780 " Germany. " - 946,000 " Belgium.
Gold and Silver Coin - - -	11,102,276	{ whereof - 6,989,945 " Belgium. " - 2,843,480 " Great Britain. " - 1,217,471 " Germany.
Total Imported in 1872 - <i>Fl.</i>	16,134,719	equal to 1,344,560 <i>l.</i> sterling.

EXPORTED.

	<i>Fl.</i>	<i>Fl.</i>
Gold and Silver Bullion - - -	4,626,560	{ whereof - 3,384,960 to Great Britain. " - 1,236,000 " Belgium.
Gold and Silver Coin - - -	14,966,780	{ whereof - 5,679,180 " Germany. " - 5,403,480 " Java. " - 2,604,150 " Belgium. " - 1,279,970 " Great Britain.
Total Exported in 1872 - <i>Fl.</i>	19,593,340	equal to 1,632,778 <i>l.</i> sterling.

1873.

IMPORTED.

	Fl.		Fl.	
Gold Bullion - - - - -	920,465	{ whereof -	579,600	from Great Britain.
		" -	332,000	" Belgium.
Gold Coin - - - - -	5,077,821	{ whereof -	2,117,800	" Great Britain.
		" -	1,829,611	" Belgium.
		" -	1,130,410	" Germany.
Total Gold Imported in 1873 - Fl.	5,998,286	equal to 499,857 l. sterling.		
Silver Bullion - - - - -	808,884	whereof -	804,280	from Great Britain.
Silver Coin - - - - -	11,754,202	{ whereof -	10,355,901	" Germany.
		" -	804,280	" Great Britain.
		" -	594,021	" Belgium.
Total Silver Imported in 1873 - Fl.	12,563,086	equal to 1,046,924 l. sterling.		

EXPORTED.

	Fl.	
Gold Bullion - - - - -	None.	
Gold Coin - - - - -	276,800	to Java.
Total Gold Exported in 1873 - Fl.	276,800	equal to 23,067 l. sterling.
Silver Bullion - - - - -	134,850	to Belgium.
Silver Coin - - - - -	15,226,500	whereof - 15,198,000 florins to Java.
Total Silver Exported in 1873 - Fl.	15,361,350	equal to 1,280,112 l. sterling.

1874.

IMPORTED.

	Fl.		Fl.	
Gold Bullion - - - - -	557,500	{ whereof -	438,000	from Great Britain.
		" -	118,000	" Belgium.
Gold Coin - - - - -	5,485,267	{ whereof -	4,067,600	" Great Britain.
		" -	1,134,752	" Germany.
		" -	282,915	" Belgium.
Total Gold Imported in 1874 - Fl.	6,042,767	equal to 503,564 l. sterling.		
Silver Bullion - - - - -	6,232,843	{ whereof -	2,852,300	from Great Britain.
		" -	1,746,238	" Germany.
		" -	1,633,005	" Belgium.
Silver Coin - - - - -	7,851,010	{ whereof -	6,226,818	" Germany.
		" -	887,322	" Great Britain.
		" -	735,862	" Belgium.
Total Silver Imported in 1874 - Fl.	14,083,853	equal to 1,173,654 l. sterling.		

NETHERLANDS.

		EXPORTED.
		<i>Fl.</i>
Gold Bullion - - - - -	-	None.
Gold Coin - - - - -	-	200 to Belgium.
Total Gold Exported in 1874 - <i>Fl.</i>		200, equal to 16½ <i>l.</i> sterling.
		<hr/>
Silver Bullion - - - - -	-	448,650 to Belgium.
		<i>Fl.</i>
Silver Coin - - - - -	-	788,750 { whereof - 571,750 to Belgium;
		" - 217,000 " Great Britain.
Total Silver Exported in 1874 - <i>Fl.</i>		1,237,400, equal to 103,117 <i>l.</i> sterling.

1875.

		IMPORTED.
		<i>Fl.</i>
Gold Bullion - - - - -	-	10,443,631 { whereof - <i>Fl.</i> 8,703,695 from Great Britain.
		" - 1,738,992 " Belgium.
Gold Coin - - - - -	-	14,171,650 { whereof - 5,480,369 " Germany.
		" - 4,697,889 " Belgium.
		" - 3,993,392 " Great Britain.
Total Gold Imported in 1875 - <i>Fl.</i>		24,615,281, equal to 2,051,273 <i>l.</i> sterling.
		<hr/>
Silver Bullion - - - - -	-	496,246 { whereof - 247,200 from Great Britain.
		" - 103,300 " Germany.
		" - 83,972 " Belgium.
Silver Coin - - - - -	-	5,741,150 { whereof - 2,387,550 " Java.
		" - 2,026,160 " Great Britain.
		" - 1,150,960 " Germany.
		" - 171,883 " Belgium.
Total Silver Imported in 1875 - <i>Fl.</i>		6,177,396, equal to 514,783 <i>l.</i> sterling.

		EXPORTED.
		<i>Fl.</i>
Gold Bullion - - - - -	-	None.
		<i>Fl.</i>
Gold Coin - - - - -	-	198,500 { whereof - 194,000 to Java.
		" - 3,000 " Denmark.
Total Gold Exported in 1875 - <i>Fl.</i>		198,500, equal to 16,542 <i>l.</i> sterling.
		<hr/>
Silver Bullion - - - - -	-	None.
Silver Coin - - - - -	-	2,654,665 { whereof - 2,600,000 to Java.
		" - 54,665 " Belgium.
Total Silver Exported in 1875 - <i>Fl.</i>		2,654,665, equal to 221,222 <i>l.</i> sterling.

RECAPITULATION.

IMPORTED.			EXPORTED.		
	Value in Sterling.			Value in Sterling.	
	£.	£.		£.	£.
1870. Gold and Silver	-	3,471,803	-	-	1,449,684
1871. Ditto	-	3,331,383	-	-	579,226
1872. Ditto	-	1,344,560	-	-	1,632,778
1873. {	Gold	499,857	-	23,067	1,303,179
	Silver	1,046,924		1,280,112	
1874. {	Gold	503,564	-	16½	103,133½
	Silver	1,173,654		103,117	
1875. {	Gold	2,051,273	-	16,542	237,764
	Silver	514,783		221,222	
Total Gold and Silver Im- ported in Six Years, from 1870 to 1875 inclusive		13,937,801	Total Gold and Silver Ex- ported in Six Years, from 1870 to 1875 inclusive		5,305,764½

Enclosure 3 of Despatch from Sir *Edward Harris* No. 62, Commercial, dated 17 October 1876.

AMOUNT of COIN and BULLION held by the Bank of the *Netherlands*, May 1875 to May 1876, inclusive.

DATE.	Coin.		Bullion.		TOTAL.	
	Fl.	ct.	Fl.	ct.	Fl.	ct.
1875:						
3 May	77,677,836	07	58,300,360	42	135,978,196	49
7 June	78,634,066	12½	58,390,360	42	137,024,426	54½
5 July	79,217,814	98½	65,629,392	47	144,847,207	45½
2 August	81,311,393	38	65,971,837	32½	147,283,230	70½
6 September	86,042,244	93	70,584,728	80½	156,626,973	73½
4 October	91,020,587	98½	69,583,804	76½	160,604,392	75
1 November	99,569,671	80½	60,560,316	12½	160,129,987	93
6 December	106,530,820	61	51,592,512	59½	158,123,333	20½
1876:						
3 January	106,728,048	19½	51,555,537	31½	158,293,585	51
7 February	114,217,596	63½	42,605,719	81½	156,823,316	45
6 March	122,614,648	17½	34,307,480	71½	156,922,128	89
3 April	126,305,212	46½	31,764,300	77½	158,069,513	24
1 May	126,719,076	60	31,742,387	16½	158,461,463	76½

NETHERLANDS.

Enclosure 4 of Despatch from Sir *Edward Harris*, No. 62, Commercial, dated 17 October 1876.

GOLD.

RETURN of GOLD coined from the 1st of July 1875 (the day on which the law of the 6th of June 1875, respecting the introduction of gold coin, came into force) to the 31st of May 1876 (since when no coinage has taken place):—

	<i>Fl.</i>
Coined for account of the Bank of the Netherlands -	37,771,620
Coined for account of private individuals - - -	19,139,440
Total - - - <i>Fl.</i>	56,911,060

SILVER.

A joint Return of Silver coined for Holland and Netherlands India, who have the same silver standard, from 1840 (the date when the present currency was introduced) up to and inclusive of 1873 - - - - - *Fl.*

	429,240,938 50
In 1874 (since when the coinage of silver has been suspended) - - - - -	31,981,415 00
Total - - - <i>Fl.</i>	461,222,353 50

Whereof the following sums were exported to Netherlands India up to the year 1873 inclusive - - - - - *Fl.*

	289,488,538 50
In 1874 no export - - - - -	—
In 1875 - - - - -	4,000,000 00
Total - - - <i>Fl.</i>	293,488,538 50

However, during the years 1875 and 1876, in consequence of a temporary rise in the exchange, several millions (the exact amount is not known, but is estimated at eight or nine millions) were sent back to Holland from Netherlands India on account of private individuals; on the other hand, recently (in August and September), a considerable exportation of silver from Holland to Netherlands India has taken place on account of private individuals (the amount of which is not known).

(Commercial, No. 68 of 1876.)

Sir *Edward Harris* to the Earl of *Derby*.

(Extract.)

The Hague, 4 November 1876.

No. 1.

I HAVE the honour to inclose herewith a translation of all the more important portions of the lengthy reply of the Netherlands Minister of Finance to the Preliminary Report of the Committees of the Second Chamber of the States-General on the Bill for the reorganisation of the monetary system of the Netherlands, and likewise a translation of the principal clauses of an amended Bill on that subject, which, in accordance with the recommendations of the Committee, has been submitted to them by the Minister.

No. 2.

The chief modifications made in the original project by the Bill now submitted are the following:—

The paragraph declaring gold to be the standard of the Netherlands currency is suppressed.

A paragraph is introduced by which the existing silver currency is maintained, whilst gold pieces of 10 and 5 florins each are to be coined, and are declared to be, concurrently with the silver coin, standard money of the realm.

The effect of this latter clause is, I should state, in effect to confirm the state of

of things at present existing in virtue of the provisional Monetary Bill passed by the States General in June 1875.

As a consequence of the foregoing provision, all the paragraphs of the original Bill which referred to the creation of a new silver coinage are suppressed in the amended Bill.

A clause is inserted in the amended Bill which suspends the further coinage of silver.

The clause in the original Bill for the demonetisation of the existing silver and copper coinage is replaced by a clause directing the demonetisation of the copper coinage only, for which latter, under the amended Bill as under the original, a bronze coinage is to be substituted.

In the amended Bill the clause is retained by which the Minister of Finance is authorised to order the melting down into bars and the sale of a portion of the existing silver coinage, and to purchase gold for the purposes of the gold coinage.

Reference is made in the enclosed extracts from the reply of the Minister of Finance to a suggestion thrown out in the Preliminary Report of the Committees of the Second Chamber respecting the negotiation of an international arrangement by which the relative value of gold and silver coin might be permanently established. But the Minister, whilst not altogether setting aside this suggestion, expresses but little hope of a practical result being attained by any attempt at a negotiation in the sense indicated.

(signed) *E. A. J. Harris.*

Enclosure 1 in Despatch from Sir *Edward Harris*, No. 68, Commercial, dated 4 November 1876.

(Translation.)

EXTRACTS from the Reply* of the Dutch Minister of Finance to the Preliminary Report of the Committees of the Second Chamber of the States General, on the Bills for the Reform of the Monetary System in the Netherlands. • 6 October 1876.

THE reasons which weigh with many members for maintaining a waiting attitude with regard to the Netherlands monetary system; or, in other words, for making no change in the present position, do not appear to the undersigned very satisfactory.

It is said in the Preliminary Report: "An unfortunate moment appeared to be selected for altogether abandoning silver as standard money, now that the price of silver was lower than it, perhaps, ever would be." Would there, then, have been stronger reason for abandoning silver as the standard if the price had not fallen so low? Is it more suitable as a standard according as it diminishes in value?

A misconception appears to have arisen on this point, of which traces are to be found in other parts of the Report, and which it is therefore important to refer to at the outset. The moment selected might be unfavorable for the demonetisation and sale of the silver coinage, but cannot be an unfavorable one for coming to the decision that silver has become unsuitable as the money standard, and that it must therefore be abandoned. But what reason is there for inferring that the Government, in case the Bill which has been presented should be adopted, will bring a mass of silver into the market? Is it not expressly said, in Section 3 of the Explanatory Statement, "The sale of the superfluous silver will have to be effected only very slowly, for it is desirable, and it is also the aim of the Government, so long as the value of our currency maintains itself in a satisfactory state, to wait for higher prices than can at present be obtained, and, until then, to have recourse to the sale of the silver only to such an extent as experience teaches us to be necessary to guard against a depreciation of our currency?"

And was not the same meaning very plainly expressed in the opening sentences of the Explanatory Statement of the Bill, in which the Government asks for an amount to cover the eventual loss on that sale, which are as follows?—

"It was considered that it had by no means been shown that the fall in the price

NETHERLANDS.

price of silver would be of an enduring character, especially as a check had arisen to the increase in the production of silver of which the diminution in value is partly the result, and this check appears in M. Cernuschi's calculations, according to which the production of silver all over the world, after having risen considerably from 1871 to 1874, again sensibly decreased in 1875."

The causes of the decline in the price of silver are to be ascribed, according to the Explanatory Statement of the Bill lately adopted in France, to the suspension or restriction in coining silver, and also, according to the Report of the English Parliamentary Commission, chiefly to the withdrawal from circulation and sale of silver in Germany, to the increased production of silver, especially in North America, and to the diminished remittances of silver to British India.

The English Commission is of the same opinion as the French Minister Say, in looking upon the first cause as temporary, and considers that it will, in the first instance, continue seriously to keep down the market. The observations of the Commission respecting the two other causes leave no doubt that those causes, though they may not be of a lasting nature, will yet operate for a very long period, and are, moreover, of overwhelming importance as regards the silver market of the future.

The production of silver, according to their Report, amounted, on an average, from 1852 to 1862, to eight or nine millions of pounds sterling, but it has since risen to almost the double of that amount.

There can, therefore, be no question as yet of a check to the progress of production.

According to the Report above mentioned, the remittances of silver from England to India, on the contrary, have, in consequence of the increased amounts which the Indian Government has annually to pay to the mother-country, decreased, during the last 4 years, by upwards of 13,000,000*l.* sterling annually.

Further, if we take into account (1) that Germany is continually bringing silver into the market; (2) that France and Belgium have, like ourselves, suspended the coinage of silver on private account, and that at the present moment silver (except as small money) can find an issue only in Asia, more particularly in British India, is not the depreciation of silver in every way a natural result? Is there, then, in the present situation, any ground for assuming that, as the members above mentioned imagine, we are on the eve of a turning-point in the depreciation of silver? Can we call that depreciation a panic?

The depreciation of silver began at the end of 1872, and has, therefore, lasted already about 4 years; it has lately taken continually increasing proportions, so that at one moment (15th July last) it amounted to 23 per cent., and now (6th October) it still amounts to 14½ per cent. The fluctuations in the price of silver showed a difference of 5 per cent. in one week. In view of these facts, can we be accused of over-haste if we, on such grounds, pronounce silver unsuitable as our money standard of the future? Nor, in the face of these facts, can an appeal, with good reason, be made to the history of our Currency Law of 1847. That appeal surely is founded on a mistake with regard to the facts of the case, which the undersigned deems it necessary to clear up, particularly as regards foreign countries.

"In 1847," says the Report, "there prevailed the same kind of panic with respect to gold. It was then supposed that a great depreciation of gold as compared with silver would ensue, and the silver standard was hurriedly introduced into this country."

The first discoveries of gold in California were made in 1849. It is evident, therefore, that there could be no question of a gold panic in 1847. It is only necessary to read the documents relating to our Act of 1847 in order to be convinced that no apprehension of the depreciation of gold, but simply objections to the *double* standard, and the notion, consequent on then-existing circumstances, that in the future silver offered better guarantees for fixity of value than gold, induced us to decide in that Act to adopt the *exclusive* silver standard.

The gold which was at that time in circulation in this country was not withdrawn from circulation till 1850, by virtue of the Act of 17th September 1849. The withdrawal from circulation was not, however, in any way the effect of a gold

gold panic. The first discoveries of gold in California had, no doubt, been already made; but the Government expressly stated, in its Explanatory Statement, that, at the time of bringing forward the Bill, no depreciation in gold had yet been remarked; it said explicitly "that it in no way agreed in the opinions of those who foresaw before long a general depreciation of gold as a result of the gold discoveries (in California)," but it added, "that it considered the subject, in the distant future, of too great importance to close its eyes with indifference to a danger which might, at some time, be threatening, and found in it an incentive not to stand still in the path on which it had entered (by the Act of 1847), but to carry out completely, and without hesitation, the monetary system which had been adopted (the exclusive silver standard)."

Can we reasonably infer that the Dutch East Indies will require no more silver in future, from the fact that in preceding years, and for a short time recently, they have remitted silver to the mother-country? If our rates of exchange with England rise, before long, so high that our gold can be profitably exported to that country, will that be a proof that in future we shall have no need of gold? If not, how can the assertion that the Dutch East Indies will still require a large amount of silver be refuted by the fact that they remitted silver a short time since?

In one of the sections (of the Second Chamber) in particular it was contended, from a more general point of view, that it was not an eligible moment for the Bill, as affecting the Netherlands, on the ground that it was possible that the great embarrassments which have arisen in other countries, as well as our own, from the present disturbance in the relative values of silver and gold, might induce various leading States, for example England and America, to adopt the system of the double standard, as it exists in the Latin Union, and also, at present, in this country.

The question put forward, "whether it be possible to arrive at an international regulation by which the embarrassments which have arisen from the disturbance of the long-existing relative values of the precious metals, not only at home but also in most other countries, could be disposed of in a satisfactory way, and if so whether such regulation would have a chance of being adopted by all civilised States," is not to be answered *à priori*, especially the latter portion of it.

A difference of opinion may exist with respect to the greater or lesser probability of success in bringing about such a regulation, supposing the attempt were made. The undersigned continues to believe the prospect of such an event to be very small. It must, however, be admitted that if it were brought about, complete in its character and with reasonable certainty that it would be permanent, not only would very essential difficulties be removed, but also a great service would be rendered to trade, industry, and credit all over the world.

For this reason, as well as for the reason that a large portion of the great expense connected with the withdrawal of our silver standard coins, both at home and in Netherlands India, might be avoided, the Government is not disinclined, while the question is openly discussed in the Chamber, to do what it can in order to promote the assembling of delegates from as many civilised States as possible in a Conference, which at first should be charged with the consideration of the means only by which the embarrassments arising from disturbance in the relative values of gold and silver may be removed in a way to satisfy all parties.

The Government is of opinion that since this Bill was brought forward another circumstance has occurred which pleads in favour of making such an attempt, namely, the increased movement in the United States of North America in favour of the silver standard. What effect this will ultimately have on the monetary system of that country cannot be known before the reassembling of Congress, and therefore probably not before 1877.

In the meantime the final regulation of our monetary system might be deferred, provided that measures were adopted for guarding against the dangers to which we stand exposed by maintaining our present position, and this might be done by authorising the Government not only to coin gold, but also by conceding to it the authority asked for to withdraw silver from circulation and to sell it, in such cases and to such an amount as may seem necessary, in order to counteract the depreciation of our currency, *i.e.*, the rise of our rates of exchange with other countries above the point which would allow of the exportation of our gold coinage.

NETHERLANDS.

In the present condition of things, there is a tolerable certainty that the rates of exchange cannot *fall* much below the point which allows of the importation of gold, but there is no guarantee whatever that those rates, if they should have unexpectedly a permanent tendency towards a *rise*, will be checked by the exportation of gold. Should this occur, we should not only be placed in the same difficulty, although in an opposite sense, against which provision is made by the Act of 6th June 1875, namely, that, through the uncertainty of the rates of exchange, all trade with foreign countries would be very difficult if not impossible, but at the same time, in consequence of the exportation of a part of the gold which had come into our possession, all that had hitherto been done towards the reform of our monetary system would be endangered.

That danger, as well as the uncertainty of the rates of exchange, would be removed, if the Government were empowered to sell and export silver, as soon as the state of the money market were such as to allow of the export of gold. The conferring of this power would be merely a measure of precaution, and would by no means prevent the permanent retention of the double standard, if afterwards an international agreement were to be brought about which made such retention possible.

No doubt, if use were really made of such authority, considerable loss on the sales of a quantity of silver would be sustained by the *Exchequer*, but such losses should not on any account outweigh the interests opposed to them.

As already remarked, the Government has no objection, on the conditions above specified, to defer for the present the definitive regulations of the monetary system of the Netherlands, while awaiting the result of the endeavours to obtain an international regulation in the sense indicated, as desired by most of the members of the Committees.

An international negotiation of this kind will, however, from the nature of the subject, occupy a comparatively long time. This time would, in the opinion of the Government, be very profitably employed, if, in the meantime, the plan proposed in the Bill for substituting bronze for our copper money were carried into effect.

The Government thinks it desirable also that the administrative regulations of the Bill be retained. As far as they are at variance with the regulations of the Act of 1847, they are founded on the newer principles of monetary legislation, and are an improvement on their predecessors, viz., among other alterations, the authorisation to exchange small money for standard coins at the Government offices, the obligation to retain in the Government offices all damaged or disfigured coins, the refusal to receive foreign coins at the Government offices &c., &c.

The principle of adopting the exclusive gold standard would then be the only thing that would have to be left out of the Bill, and the regulations in connexion with it affecting the changing and withdrawal from circulation of the silver standard coins, and the new silver small money, in place of which would have to be inserted regulations in accordance with the Act of 1875. On the other hand, it would require to be supplemented with a regulation by which the coining of silver standard money would remain suspended.

In this sense the original Bill has been amended.

Enclosure 2 in Despatch from Sir *Edward Harris*, No. 68, Commercial, dated 4 November 1876.

(Translation.)

Chief Provisions of an amended Bill for the Regulation of the Monetary System of the Netherlands.

The standard coins, besides the silver coins enumerated in Article 2 of the Act of 26th November 1847, consist of the following gold coins:—

The 10-florin piece.

The 5-florin piece.

The gold standard coins contain 6,048 ten-thousandth parts (0.6048) of a gramme of fine gold to the florin.

The

The standard of fineness of the gold coin is 0·900 with a margin of one five thousandth part, as well above as below that standard.

The weight is :—

Of the 10-florin piece, 6·720 grammes.

Of the 5-florin piece, 3·360 grammes.

The margin in weight is :—

For the 10-florin piece, 2 thousandth parts,

For the 5-florin piece, 2 five-thousandth parts
of the weight, as well above as below the legal weight.

The copper coinage which, in accordance with the Acts of September 28th 1816 and November 26th 1847, is now in circulation, shall be replaced by a bronze coinage.

The bronze coins are :—

The 2½-cent piece.

The 1-cent piece.

The ½-cent piece.

The metal of the bronze coins is composed of 0·950 of copper, 0·040 of tin, and 0·010 of zinc, with such margin as for each of those metals shall hereafter be assigned by us.

The weight is :—

Of the 2½-cent piece, 4 grammes.

Of the 1-cent piece, 2·5 grammes.

Of the ½-cent piece, 1·25 grammes.

The margin of weight is, for each of these, 1 per cent.

The gold commercial coins consist of the golden ducat and the double ducat.

The standard of the gold commercial coins is 0·983 with a margin of one-thousandth, as well above as below that standard.

The weight is :—

Of the ducat, 3·494 grammes.

Of the double ducat, 6·988 grammes.

The margin in the weight is, for both pieces, two thousandths of the weight, as well above as below the legal weight.

Every person has the right to have gold standard pieces and commercial pieces coined at the Royal Mint, when no work on Government account prevents this being done.

Small money is coined exclusively on Government account.

The Master of the Mint is not bound to coin gold for private individuals in quantities of less than 100 kilogrammes in weight.

Our Minister of Finance is empowered to regulate, according to circumstances, the number of coins of each of the several kinds which shall be coined from the gold taken to the Mint for coinage into standard money.

The charge for coining to be paid by private individuals shall be determined by us, by a general regulation.

That charge shall not, however, be at a higher rate than

Five florins per kilogramme for 10-florin pieces, and for 5-florin pieces, if not asked for by the applicant, but delivered to him by virtue of the second paragraph of the preceding article ; and

Six florins per kilogramme for 5-florin pieces, if asked for by the applicant.

No one is compelled to receive silver small money or bronze coins to a larger amount than—

Five florins in 25-cent, 10-cent, and 5-cent pieces ; or

Twenty-five cents in 2½-cent, 1-cent, and ½-cent pieces.

Silver small money is taken to any amount in payment at the Public Departments.

Coins disfigured, clipped, or diminished in value, otherwise than by wear-and-tear, are not received at the Exchequer. No one is bound to take them.

NETHERLANDS.

Silver standard money shall no longer be coined until such be provided for by further legislation.

The copper coinage struck in accordance with the Acts of 28th September 1816, and of 26th November 1847, shall be withdrawn from circulation at such periods and in such manner as shall be determined by us, either at one time or by degrees, after an opportunity shall have been afforded the public, during at least a fortnight, for exchanging the same.

Until this withdrawal those coins shall continue to be a legal tender, as at present, under reserve of the conditions above set forth respecting the maximum of bronze money to be taken in payment.

Our Minister of Finance is empowered to melt down a portion of the current silver standard coins into bullion, and to sell that bullion, as well as to buy gold on Government account and coin it into standard money.

This Act shall come into operation on 1st January 1877. The last paragraph of the foregoing clause shall, however, come into force from the day of its promulgation, and the regulations respecting the bronze coinage shall not be applicable till 1st July 1877.

(No. 71, Commercial.)

Mr. *Fenton* to the Earl of *Derby*.

(Extract.)

The Hague, 25 November 1876.

THE amended Bill for the regulation of the monetary system of the Netherlands, the chief provisions of which were explained in Sir E. Harris' Despatch to your Lordship, No. 68, Commercial, of the 4th instant, was approved by the Second Chamber of the States General, in its sitting of yesterday, by a vote of 37 to 25.

In the course of the debate on the general principle of the Bill, the Minister of Finance declared distinctly in a speech (whereof I have the honour to enclose a summary), that, so far as concerned the provisions referring to the gold and silver coinage, the Bill must be considered as having only a provisional character, its sole definitive provision being that for the substitution of the bronze coinage for the copper coin now current. It was evident, his Excellency said, that it would be absolutely necessary, at no distant period, to come to a final decision as to the standard to be ultimately adopted by the Netherlands; and he gave it clearly to be understood that, in his opinion, that decision must be in favour of the gold standard, as proposed in the Bill originally laid before the Chamber by him.

During the debate on the details of the Bill, some slight modifications were introduced, the only one worth recording being the suppression of the paragraph which authorised the coinage of gold pieces of 5 florins. The amendment to this effect, though opposed by the Minister of Finance, was carried, on a division, by 34 votes to 25. The only description of gold piece to be coined under this Bill will consequently be that of 10 florins, as under the provisional Bill which was passed in the month of June of last year, and will remain in force until the new Bill becomes law.

After the vote on the Bill above referred to, the Bill regulating the monetary system in the Dutch East Indian Possessions, as described in Sir E. Harris' Despatch, No. 64, of 22nd June last, was at once brought on for consideration, and was carried, after a very short debate, by a vote of 59 to 1; though not until an amendment had been carried by 47 to 14 against the Government, to leave out the clause authorising the Governor General to demonetise and sell silver coin.

(signed) *H. P. Fenton*.

Enclosure of Mr. *Fenton's*, No. 71, Commercial, dated 25 November 1876.

SUMMARY of the Speech of the Minister of Finance on the Bill for the Regulation of the Monetary System of the Netherlands, in the Sitting of the Second Chamber on the 24th of November 1876.

THE Minister of Finance began by some general observations to the effect that it was necessary not to lose sight of what had in previous times been said and done with reference to this monetary question, nor the connexion that existed between what had occurred here and what had occurred abroad. After describing shortly the existing state of things with respect to it in this country, he said that he had listened with interest to the different views expressed in the course of the debate by the members of the Chamber on the currency question. Of course every member had a right to discuss the question as he thought proper; but he asked whether, in the interests of the subject itself, it were desirable, on each occasion when it came forward, to discuss over again points which had already been maturely discussed and decided on. He said that it was necessary above all to bear in mind that the Bill now before the Chamber was only a provisional measure and the unavoidable result of existing circumstances.

Regret had been expressed by one of the speakers in yesterday's debate that he (the Minister) had not adhered to his original proposition with reference to the adoption of the gold standard, and had given no sufficient reasons for abandoning that proposal. But he was of opinion that the reasons therefore had been fully developed in the written communications which had passed between the Chamber and himself on this subject. The majority of the members of the different committees had expressed the opinion that it was desirable before coming to any definitive conclusion to wait for the result of the deliberations of a proposed international conference, and he had consequently been guided by that expression of opinion. As regards that international conference, the Government doubted from the outset that it would lead to any practical result, and had therefore determined to confine themselves, for the present, to what is set forth in the Bill under discussion.

There was, he said, one additional argument in favour of this Bill which should be mentioned, viz., that in the year 1879, specie payments either in gold or silver must be resumed in the United States of America. It is therefore highly desirable that the question of a definitive standard for the Netherlands should be left open. A third reason in favour of the Bill is the very considerable difference in the value of silver at the present time as compared with what it was a few months ago. If this Bill were supposed to involve a complete change of system, that was a mistaken view. The Government is convinced that within a comparatively short period a decisive step must be taken with reference to the standard, and, in his opinion, there can be little doubt in which direction that step must be taken. The object of the present Bill is to defer the taking of that step, and to await the course of events.

As regards the details of the Bill, there was one to which he considered it necessary to refer, viz., the authorisation to be accorded to the Government to demonetise silver whenever they might consider it to be necessary. There was nothing new in this proposed authorisation. The most important financial associations of this country, amongst others the Bank of the Netherlands, had approved it, and had expressed the opinion that it would afford the best means of counteracting the rise in the exchange and the export of gold.

The Government considered this authorisation as necessary in order to make head against the difficulties which might arise out of the present undefined state of things, that is to say, the absence of any determined system. We have, he said, at the present time only what might be called an "*étalon boiteux*," and this is equivalent to no standard at all. If the authorisation be granted, the Government would have it in their power, in the event of a considerable augmentation in the price of silver (which is now 54 *d.* per ounce), to proceed to the sale of such quantity of silver as is to be allowed under the present law. His object, he said, was to avoid the difficulties of the present moment, and he thought that the partisans of the double standard, as well as those of the gold standard, could desire nothing more than that the large stock of silver which

NETHERLANDS.

we now have on hand should be reduced by sales whenever the price should be favorable.

As regards the interests of trade, he said that it was particularly in that sense that the authorisation was needful, in order that the Government should be able to protect the commercial community from the effects of an extreme rise in the rate of exchange. He stated that an account would be regularly published in the official Gazette of the silver demonetised and the price at which it had been sold. He might add, that the Bank of the Netherlands had offered no objections to the Bill under consideration. He ended by stating that the only provision of the Bill which had really a definitive character was that for the substitution of the bronze for a copper currency; all the other provisions must, as he had already stated, be considered as being provisional, and such as would not prejudice the future.

(Commercial, No. 76 of 1876.)

Mr. *Fenton* to the Earl of *Derby*.

(Extract.)

The Hague, 19 December 1876.

IN my Despatch, Commercial, No. 71, of the 25th ultimo, I had the honour to report to your Lordship that the two Bills for the regulation of the monetary system in the Netherlands and in the Dutch East Indian Possessions had passed the Second Chamber of the States General.

The first named of those two Bills came on for discussion yesterday in the First Chamber, and, after a prolonged debate during the day, followed by an adjourned debate in the evening which lasted to a late hour, the Bill was rejected by a majority of 16 to 11.

From a summary of the debate which has been published this morning, it appears that the Bill was opposed on three separate grounds, viz., by one group of members, because it did not maintain the sole silver standard; by another group, because it did not establish the sole gold standard; and by a third, because they deem fresh legislation on the monetary question inopportune at the present time, and that the proper course to adopt would be simply to prolong the provisional monetary law passed in the month of June 1875,* which, if not renewed, will expire at the end of the present year.

(signed) *H. P. Fenton*.

(Commercial, No. 80 of 1876.)

Mr. *Fenton* to the Earl of *Derby*.

(Extract.)

The Hague, 25 December 1876.

IN view of the impossibility of maturing any fresh legislation on this subject previous to the expiration, on the 31st instant, of the Provisional Monetary Law of 1875 now in force, this Government had no alternative but to propose to the Legislature simply to prolong the duration of that law until the 31st of December 1877, whereby time would be given to the Government to reconsider the whole question of the definitive regulation of the monetary system.

A short Bill to that effect was accordingly laid before the Second Chamber a few days ago, and having been approved at once by the Committee of the Chamber,

* Sir E. Harris to the Earl of Derby, No. 53, 30th April 1875, and No. 75, 10th June 1875.

Chamber, was passed by the Chamber itself on the 23rd instant by a unanimous vote, after an amendment proposing to extend the duration of the Bill to the end of 1880, instead of 1877, had been rejected by 33 to 24 votes.

The sanction of this Bill by the First Chamber will be asked as soon as they meet next week, in order that it may be approved by the King and become law before the day on which the existing law will expire.

I should add that, in consequence of the rejection of the Monetary Bill for the Netherlands by the First Chamber, the Bill for the regulation of the monetary system in the Dutch East Indies, which had likewise received the sanction of the Second Chamber, will not be proceeded with.

(signed) *H. P. Fenton.*

(Commercial, No. 14, of 1877.)

Mr. *Fenton* to the Earl of *Derby*.

My Lord,

The Hague, 10 February 1877.

IN my Despatch of this series, No. 76, of the 19th of December last, I had the honour to report to your Lordship that the First Chamber of the States General had, at one of its last sittings previous to the adjournment for Christmas, rejected the Bill for the regulation of the monetary system of the Netherlands, which had been sent up approved from the Lower Chamber.

In consequence of this rejection the Bill regulating the monetary system in the Dutch East Indies (which had likewise been approved by the Second Chamber) could not be proceeded with, as two of its clauses, drawn in contemplation of the Monetary Bill for the Netherlands becoming law, contained a direct reference to certain clauses of the latter.

The Bill for Netherlands India was therefore withdrawn, with an understanding that it should be amended and again brought forward by the Government on the reassembling of the Second Chamber of the States General after the Christmas and New Year's holidays.

I may here mention (as reported to your Lordship in my Despatch, Commercial, No. 80, of the 25th of December last) that on the rejection, above referred to, of the Monetary Bill for Holland, this Government proposed to the Chambers the renewal, for a further twelvemonth, of the law passed in June 1875, and which would have expired on the 31st of December 1876, for the temporary settlement of the monetary question in respect of the kingdom itself, and that this proposal was at once agreed to by both Chambers, and became law on the 1st of January 1877, the Government giving the Chambers to understand that in the course of that further twelvemonth a fresh attempt would be made by the Government to bring to bear a law permanently settling the question.

The Second Chamber of the States having now resumed its sittings after the holidays, the Minister of Finance has reintroduced, according to his promise, the Monetary Bill for the Dutch East Indies, and I have the honour to inclose a translation thereof.

It is a reproduction (with only the necessary verbal alterations) of the old Bill in the form in which it was passed by the Second Chamber in November last, its principal feature being the establishment, in the Dutch East Indies, of the double (*i.e.*, the gold and silver) standard, in place of the existing sole silver standard.

I have, &c.

(signed) *H. P. Fenton.*

NETHERLANDS.

(Translation.)

AMENDED BILL for the Regulation of the Monetary System in the Dutch East Indies.

We, William III., by the grace of God, &c., &c., &c.

Whereas We have considered it necessary to further modify the law of 1st May 1854, for the regulation of the monetary system in Netherlands India, which was already modified by the Laws of 20th April 1855, 24th December 1857, 22nd June 1862, 26th December 1863, 15th September 1866, and 27th November 1873;

Therefore, after having consulted the Council of State, &c., &c., &c., We have seen fit to order, and We order as follows:

Article 1.

The 1st Article of the Law of 1st May 1854 is modified as follows:—

“The unit of the monetary system in Netherlands India is the florin, divided into 100 cents. The legal coins of the State in Netherlands India are gold and silver standard coins, silver and copper fractional coins, and gold commercial coins.”

Article 2.

The 2nd Article of that law is modified as follows:—

“The gold standard coin is the 10-florin piece, as described in the Law of 6th June 1875.

“The silver standard coins are the following,—

The florin,

The rix-dollar, or piece of $2\frac{1}{2}$ florins,

The $\frac{1}{2}$ -florin,

as they were defined by the Law of 26th November 1847.”

Article 3.

The 5th Article of the Law of 1st May 1854, is modified as follows:—

“The commercial coins are,—

The gold ducat and double ducat, as defined by the Law of 26th November 1847.”

Article 4.

The 12th Article of the Law of 1st May 1854 is modified as follows:—

“Foreign gold and silver coins, the current value of which shall have been fixed by the Governor General, shall be accepted at such public Treasury Offices as may be designated by him.”

(Commercial, No. 15, of 1877.)

Mr. Fenton to the Earl of Derby.

My Lord, The Hague, 12 February 1877.

I HAVE the honour to inform your Lordship that the Netherlands Minister of Finance has laid before the Second Chamber of the States General a Bill providing for the substitution of a bronze coinage in place of the existing copper coinage of the Netherlands, and forbidding the circulation in this country of foreign coins of copper, bronze, or nickel.

The provisions of the Bill now presented correspond precisely with those set forth in the Articles having reference to a new bronze coinage which formed part of the Bill for the general regulation of the monetary system of the Netherlands (translation whereof was inclosed in Sir E. Harris' Despatch, Commercial, No. 68, of the 4th of November last), which, as your Lordship is aware, was approved by the

Second

Second Chamber of the States General in November last, but was subsequently rejected by the First Chamber.

NETHERLANDS.

I shall have the honour of forwarding a copy and translation of the text of the new Bill to your Lordship, if it should become law.

The Earl of Derby,
&c., &c., &c.

I have, &c.
(signed) *H. P. Fenton.*

(Commercial, No. 23, of 1877).

Mr. *Fenton* to the Earl of *Derby*.

My Lord,

The Hague, 26 February 1877.

FROM a statement published by the Netherlands Minister of Finance in the "Official Gazette," it appears that the following coins were struck at the Netherlands Mint during the year 1876, viz. :—

For account of the State,—

1,000,000 silver coins of 10 cents each.
200,000 ditto of 5 cents each.
13,047,000 copper coins of 1 cent each.
2,020,000 ditto of $\frac{1}{2}$ cent each.

For account of private individuals,—

1,581,106 gold coins of 10 florins each.
44,408 gold ducats.

The whole of the foregoing (exclusive of the gold ducats, which are not standard coins) represents a nominal value of 16,061,630 florins, equal to 1,338,469 $\frac{1}{2}$ sterling.

I have, &c.
(signed) *H. P. Fenton.*

GERMANY.

GERMANY.

Enclosure in Lord *Odo Russell's* No. 52, Commercial, of 30th October 1876.

(Translation of an article in the "Hamburgische Börsen-Halle" of 6th October 1876.)

SURPLUS SILVER IN GERMANY.

THE question as to how much silver Germany will have at disposal as the result of the withdrawal of the coinage continues to occupy the serious attention of all persons interested in the subject. The estimates formed on this point have differed widely, but as detailed information has been furnished by a statement in the "Centralblatt for the German Empire" of 29th September 1876, showing the amount withdrawn from circulation by the Imperial Government up to the end of August, we will endeavour, from this and other sources, to place before our readers an estimate of the surplus stock of silver in Germany.

As the basis of our calculations, we shall avail ourselves of the statistics prepared by the Imperial Chancery, and forming No. 15 of the Parliamentary

GERMANY.

Papers of 1873. According to these returns, the coinage in circulation at the end of 1871 was estimated as follows:—

Thaler Currency.

Silber-Courantmünzen*	=	Thl. 494,568,000	=	M. 1,483,704,000
Silber-Scheidemünzen†	=	„ 15,251,000	=	„ 45,753,000
Total - -		Thl. 509,819,000	=	M. 1,529,457,000

South German Gulden Currency.

Silber-Courantmünzen	=	Thl. 68,267,000	=	M. 204,801,000
Silber-Scheidemünzen	=	„ 10,502,000	=	„ 31,506,000
Total - -		Thl. 78,769,000	=	M. 236,307,000

The local currency of the various smaller States in Germany we will pass over for the present.

The withdrawal of the whole of the gulden currency, which has been effected during the present year, has yielded *M.* 195,669,000, or 82 per cent. of the amount estimated as having been coined. A comparison of the various tables shows the remarkable result that a very much larger amount of the silver gulden currency has been collected than according to previous accounts had been coined. For while, as already remarked, the value of the smaller coinage had been estimated at *Thl.* 10,502,000, or *M.* 31,506,000, the kreuzer coins have alone yielded a sum of *M.* 39,581,000. The small coinage struck before 1837 must, therefore, have been exceedingly large.

Turning to the thaler currency, we find that the withdrawal of the 2½, 2, 1, and ½ groschen† coins, which have all been called in during the present year, has yielded *Thl.* 10,578,000, or *M.* 31,734,000, besides an amount of *Thl.* 1,158,000 in obsolete Hanoverian 2½-groschen pieces, up to the end of August. When the receipts in September are added to these amounts, the total will show an excess above the estimate, but not so large as in the case of the gulden currency.

The “Courantmünzen” of the thaler currency are the 2 and 1 thaler pieces and the 10 and 5 groschen pieces, and it is from a calculation of the amount of these coins that an estimate can be formed of the quantity of silver that Germany will be able to bring to market. It will be remembered how diverse opinions have been as to the amount of these coins that had been melted down for private account. The Report of the English Parliamentary Committee on the Depreciation of Silver has shown that the loss from this cause is variously estimated at from one-third to two-thirds; or, in other words, that while some assumed that there was at the end of 1871 only about *M.* 495,000,000 in circulation (including the sums in the various Banks), others estimated the amount at *M.* 990,000,000. Had the first estimate been correct, the quantity of surplus silver would have been comparatively moderate, for the report of thaler currency withdrawn up to the end of August last amounted to nearly *M.* 317,000,000, which would leave not more than *M.* 178,000,000 in circulation.

A closer examination of this question leads, however, to the conclusion that the estimate of a loss of only one-third of the coinage through private melting-down is much nearer the truth. The Imperial Government ordered some time ago that the 2-thaler pieces received at the public offices should not be put in circulation again, but paid into the Imperial Treasury. In this way, without a formal withdrawal, an amount of *Thl.* 42,120,192 has been received. The 2-thaler pieces struck were,—

From 1838 to 1857	- - - -	Thl. 50,996,694
„ 1857 to 1871	- - - -	„ 13,977,694
Total	- - -	Thl. 64,974,388

It

* Lit. “silver current coins,” viz., the 2, 1, ½, and ¼ thaler pieces.

† Lit. “silver small coins,” viz., the 1/10, 1/15, 1/20, and 1/30 thaler pieces.

‡ 1 thaler = 30 groschen.

It thus appears that of this coinage, which being the largest is most available for melting, about 65 per cent. has been already withdrawn, and the proportion will in all probability increase rapidly when it has been called in by a formal order.

The total amount of the old German local currency, including a number of foreign "crown thalers," received by Government up to the end of August, was equal to *M.* 561,411,000, leaving the comparatively small amount of *M.* 14,283,000 to be yielded by other than the thaler and gulden currencies.

In completion of the statistical notices of the Mint operations, we append a statement of the application of the coinage withdrawn to the coinage of the new Imperial marks currency, as well as a statement of the imports of silver from Germany into England furnished in the Custom House Returns.

The value of the coins struck at the various Mints was as follows :—

Year 1873	-	-	-	-	-	-	<i>M.</i>	2,350,295
„ 1874	-	-	-	-	-	-	„	36,331,621.40
„ 1875	-	-	-	-	-	-	„	114,558,994.60
To 23rd September 1876	-	-	-	-	-	-	„	147,912,426.20
Total								<i>M.</i> 312,153,337.20

It would, however, be erroneous merely to subtract this amount from that of the currency withdrawn from circulation in order to ascertain how much silver the Imperial Government has sold, or has at its disposal. It must be remembered that not 90 but 100 Imperial marks are coined from one pound of fine silver. On the other hand, it should be borne in mind that each 90,000 marks' worth of old silver coinage of the thaler and gulden currencies, instead of yielding 1,000 lbs. of fine silver, will be subject to a reduction of 1 or 2 per cent., if not more, for loss from wear. The *M.* 561,411,000 called in up to the end of August would, therefore, probably yield the following amount :— The coinage of 312,153,000 Imperial marks, struck up to the 23rd of September, would require, at 100 marks per lb., about 6,113,000 lbs. of fine silver, leaving a surplus of 3,122,000 lbs., or, in round numbers, about 3,000,000 lbs.

Up to the 14th of March last 1,260,000 lbs. of fine silver, in bars, was sold by the Imperial Government. If 200,000 to 250,000 lbs. be taken as the quantity sold since per month, that would give a total, up to the end of August, of 2,500,000 lbs., and would leave the surplus in the hands of the Government by no means so large as it has been supposed to be.

The registered import of silver into the United Kingdom from Germany is thus stated :—

						£.
Year 1873	-	-	-	-	-	424,762
„ 1874	-	-	-	-	-	2,351,968
„ 1875	-	-	-	-	-	1,152,523
To end of August 1876	-	-	-	-	-	2,686,271

The statistics confirm the reported large increase of the export of silver from Germany during the present year, which has not been lessened even by the fall in the value, and has brought Germany very much nearer the goal of the substitution of the silver thaler currency by a gold coinage.

After a consideration of the foregoing particulars respecting the original amount of the thaler currency, and the result of the withdrawal of coin up to the present time, it may, with tolerable accuracy, be assumed that an amount of more than 500 million marks is still in circulation in the form of thaler and 5 and 10 groschen pieces, which (apart from the Austrian thalers) may be expected soon to be withdrawn, while the coinage of the remainder of the intended amount of ten marks' worth of small coin per head of the population will absorb about 1,120,000 lbs. of fine silver.

Since the publication of the foregoing article, it has been reported that a proposal has been submitted to the Imperial Council to increase the amount of subsidiary coinage to *M.* 15 per head, the amount of *M.* 10, fixed by the law of 9th July 1873, having proved inadequate to the wants of the population. Should this amendment be adopted, the amount of surplus silver will be very considerably reduced.

GERMANY.

(Commercial, No. 58.)

Lord Odo Russell to the Earl of Derby.

My Lord,

Berlin, 1 November 1876.

I AM informed that so strong is the feeling in the Reichsrath against the measure, that the Imperial Government have decided not to bring before it the resolution passed by the Bundesrath to increase the coinage of silver from 10 marks to 15 marks per head of the population, an operation which would have absorbed silver to the amount of about 250 millions of marks. This sum will consequently be still eventually thrown upon the market.

I have, &c.

(signed) Odo Russell.

Enclosure in Lord Odo Russell's No. 70, Commercial, of 15th November 1876.

Mr. Ward to Lord Odo Russell.

(Extract.)

British Consulate, Bremen (and Brämerhaven),

5 November 1876.

The operations for the demonetisation of the old German silver currencies, the supply and the coining of the requisite new stock of silver for the use of the inhabitants of my consular district, viz., the Free City of Bremen, the Grand Duchy of Oldenburg, and parts of the Prussian province of Hanover, though to a certain extent put into execution by the Government and local authorities of the several States mentioned, are, since introduction of the Imperial Laws establishing the new German gold currency, regulated entirely by the German Federal Authorities at Berlin.

* * * * *

The aggregate value of all silver coins of all of the different States of Germany brought into circulation previous to the year 1871 is officially estimated to have amounted to about 88,235,294 *l.* sterling.* Of this amount, it is estimated that one-third has, in course of time, been melted down, either for technical purposes, or converted into bar silver for the use of commerce, so that the actual amount remaining in circulation in 1871 is calculated to have reached the value of 58,823,530 *l.* sterling.

The value of the old silver coins withdrawn from circulation since that year until the end of September 1876, for account of the German Empire, distributed amongst the several States of Germany which coined silver, is stated to have been respectively as follows:—

Silver coins of—	Value in Sterling
	£.
The "Thaler" currency	19,052,690
The South-German "Florin" currency	9,591,638
Crown Thalers	390,870
"Convention Coins" of the 20-Florin currency	93,618
Old Saxon (Electoral and Royal)	2,620
Schleswig-Holstein	79,306
Hanover (former kingdom of)	79
Mecklenburg	10,040
Hamburg	86,599
Lübeck	37,024
Totals	£. 29,344,484

Deducting

* The rate of exchange is, in this and all the following sums, calculated at 2,040 marks per 100 *l.* sterling.

	£.
Deducting this latter sum of 29,344,484 <i>l.</i> from the above-mentioned sum of 58,823,530 <i>l.</i> , it will appear that the value of the old silver coins still in circulation on 1st October 1876 was - - - - -	29,479,046
To this amount, however, should be added the value of the Austrian Thalers redeemable by the German Empire, viz. - - - - -	2,941,176
Which thus gives the total sum of - - - - - £.	32,420,222

	£.
The aggregate amount of silver to be coined for circulation in Germany is, according to the existing Federal regulations, fixed at the rate of 10 marks (9 <i>s.</i> 10 <i>d.</i> sterling) per head of the population of the Empire, and taking the latter to be 43,000,000, represents the sum of 430,000,000 of marks, or - - - - -	21,078,431
Of this amount, there have been coined, until 28th October 1876 - - - - -	16,624,311
Thus leaving yet to be coined - - - - - £.	4,454,120

It will accordingly appear that (providing the present rate of 10 marks per head of the population be adhered to) the value of the aggregate quantity of silver at the disposal of the German Government for sale amounts altogether to 27,966,102 *l.* sterling. An official statement of the quantity hitherto sold has not been made public; but by competent authorities it is estimated that up to the end of May last, the sales reached the value of about 7,843,137 *l.* sterling, so that, presuming this estimate to be correct, there are (since the beginning of June last) 20,122,965 *l.* worth of silver disposable for sale in the hands of the Government at present.

During the last few months, the opinion expressed already by several members at the time of the debate on the Coinage Laws in the German Parliament has been gaining ground amongst commercial, financial, and other classes in this country, viz., that the rate of 10 marks per inhabitant above referred to must be considered as inadequate for meeting the requirements of the public, and that it has been proposed on many sides to raise the existing rate to at least 12½ marks, so as to provide a more considerable amount of silver coins than will be supplied by the present arrangement. The German Federal Authorities, however, have, it appears, after some hesitation, decided to make no such change, at present at least, but it is here regarded as not improbable that such a step will have to be taken, sooner or later. Whenever the same does take place, its effects will, of course, not fail to make themselves felt (in a greater or less degree, according to the rate of increase) upon the price of silver in all markets of the world. For Germany itself such a measure, presuming the present low price of silver should continue, would be attended with considerable pecuniary advantage, for, apart from the question as to whether it would really confer a benefit upon the public by meeting a widely-expressed want, it is evident (according to my humble opinion) that, by an increase of the amount of silver destined for circulation, the quantity left, under unfavorable market quotations, in the hands of the German Government would be diminished, whilst at the same time the Government would be able to convert a further portion of its stock of silver into coin at a comparatively high rate of issue.

(signed) *William Ward.*

GERMANY.

(No. 6, Commercial.)

Mr. *Petre* to the Earl of *Derby*.

(Extract.)

Stuttgart, 25 September 1876.

I HAVE inquired of Count Uxkull whether any such information, specially applicable to Wurtemberg, is to be obtained, and, if so, whether the Wurtemberg Government could supply me with it. Count Uxkull replied that the local Governments and Legislatures of Germany had ceased, individually, to have anything to do with the currency question, and that the coinage operations of the Mint at Stuttgart were carried on, and the stock of silver was held, exclusively on account of the Central Government. All the facts and statistics bearing upon the subject were in possession of the Imperial Government, and he assured me that there was no special information to be got here in respect to the currency question which was not included in the official returns published at Berlin. Count Uxkull, at the same time, expressed to me his conviction that the demonetisation of the thaler currency would be a very slow and gradual process.

The whole of the silver coinage appertaining to the gulden currency has, for more than a year, been withdrawn from circulation, and apparently without any, even temporary, inconvenience resulting from the change of currency. Thalers are used very extensively in the ordinary daily transactions of the public, in place of the banknotes of small amount withdrawn from circulation. The amount of subsidiary currency seems to be sufficient, but not more than sufficient, for the present wants of the public, and any general use of gold coin for small payments is, for the present at least, I think exceedingly improbable.

(signed) *George Petre*.

(No. 4, Commercial.)

Mr. *Jerningham* to the Earl of *Derby*

(Extract.)

Darmstadt, 14 October 1876.

THE German Empire having introduced a uniform monetary system throughout its dependencies has reserved to the capital the privilege of regulating and influencing the currency.

The Grand Ducal Mints at Carlsruhe and Darmstadt operate only to the extent of what the Berlin Mint permits, and the latter determines the necessary measures for the withdrawal of the old currency or the coinage of new.

Both these petty sovereignties are unable, therefore, to claim more than a correct effigy of their ephemeral rulers on the currency which they are allowed to issue.

No silver is produced in either Grand Duchy, and hence the Government supply is not always able to meet the requirements of the industrial banks.

It thus follows that these banks are often obliged to obtain their supply elsewhere, and a correct supervision of Government over their requirements thus becomes impossible.

From these remarks, it will be seen that the depreciation of silver in either Grand Duchy must depend on the present and future currency laws of the Empire, and not on the special measures taken in each Grand Duchy to prevent abuses against the Imperial laws.

(signed) *Hubert E. H. Jerningham*.

D E N M A R K.

DENMARK.

(No. 34, Commercial.)

Sir *Charles Wyke* to the Earl of *Derby*.

(Extract.)

Copenhagen, 10 October 1876.

THERE has been no *demonetisation*—in the strict meaning of the term—in Denmark.

In accordance with the provisions of the Mint Act of the 23rd of May 1873, the old silver currency ceased to become legal tender on and after the 1st instant,* the same being substituted by gold.

In this conversion, the relative value of gold to silver is taken as 15·675 to 1, the loss, if any, being of a fractional character.

The silver thus withdrawn from circulation has, I understand, been sold to England.

(signed) *Charles Lennox Wyke*.

S W E D E N.

SWEDEN.

Enclosure of Mr. *Erschine's* No. 46, Commercial, of 3rd November 1876.

REPORT by Consul *Segrave* on the Production and Distribution of Silver in Sweden.

(Extract.)

British Consulate, Stockholm,
2 November 1876.

Production.

THE three mines within this consular district, namely, Sala, Falun, and Lofa, produced in 1875 about 17,880 oz.

Distribution.

Was employed entirely in the country. The Sala mine produced about 9,960 oz., the whole of which they are bound to deliver to the National Bank.

Exportation.

Bullion, about 42 oz.

Coin to the value of 7,984 *l*.

Importation.

Bullion, about 3,240 oz.

Coin to the value of 58,095 *l*.

The bullion is imported almost exclusively from England.

Coinage.

The silver coinage now current in Sweden was commenced in March 1874, and produced, up to July 1876,—

6,041,659 one krona pieces.

1,908,354 $\frac{1}{2}$ " "

5,355,674 $\frac{1}{4}$ " "

6,192,729 $\frac{1}{10}$ " "

or to the total value of about 497,467 *l*.

The silver for this coinage has been obtained almost exclusively from the National Bank, in the shape of ingots and old coin.

* i. e. 1 May 1873. See page 129 of the Appendix to Report from the Select Committee on Depreciation of Silver.

SWEDEN.

Enclosure of Consul *Segrave's* No. 1, Commercial, of 12th January 1877.NOTE by Consul *W. F. Segrave* on the Price of Silver in Sweden.British Consulate, Stockholm,
11 January 1877.

IN Sweden there has never existed any market, properly so called, for the precious metals.

Foreign coins have been changed by the National Bank, or by moneychangers, at prices depending upon their respective values; but the whole business has been mainly one of coin-changing on a small scale, and no official quotations have ever appeared.

While silver was the monetary standard of the country, the National Bank used to supply its wants from Hamburg at a fixed price.

About 1860, however, the bank turned its attention to the London market, where the fluctuating price of silver furnished an opportunity for getting that metal cheaper than in Hamburg,

There was besides another reason for giving the preference to the London market, viz., the greater nicety of the assays, it being soon discovered that the difference in the fineness of the bars when re-assayed at the Royal Mint of Sweden was not worth mentioning, while bars from Hamburg generally turned out one to two thousandth parts lower than given in the accompanying certificates, sometimes even as much as four thousandth parts.

Occasionally, when exchanges were very favorable, even private persons imported silver, but always with the view of selling it to the Riksbank, which was bound to receive it according to the weight and fineness of the Royal Mint certificates, with a deduction of $\frac{1}{2}$ per cent. for cost of coinage, which deduction, however, was often remitted, to the advantage of the vendor, as the bank had no absolute need to coin its whole stock of bullion.

The small quantities of silver required by silversmiths were procured by melting down old pieces, or else taken from the Riksbank.

When, in May 1873, the gold standard was passed by the Riksdag, the Riksbank had to look out for means of disposing of its superfluous stock of silver, beyond what was required for the new fractional coinage, and a small reserve for meeting the possible demands of holders of notes payable in silver. Of course there was a strong presumption against such demands being made on a very extensive scale, as such would lead to the manifest loss of the holders; besides, with the rapid pace at which notes of the older kind payable in silver were daily exchanged against new ones payable in gold, it was evident that within a limited period notes on silver could hardly be held to any considerable amount.

The surplus silver was partly disposed of in 1874-75, especially when, after a fall in the price of silver in the London market towards the end of 1873, prices in the early part of 1874 recovered to about 59 *d.*

During the present year the Riksbank has disposed of the greater part of the remaining surplus at prices between 53 *d.* and 54 *d.* per ounce, being in such operations entirely guided by the London market.

It will thus be seen that no open or independent market for the precious metals has ever existed in Sweden, that the prices have not been regulated by the laws of demand and supply, and that the amounts imported have been determined almost entirely by the wants of the bank for coining purposes or the augmentation of its metallic reserve.

The price of gold while the monetary standard of the country was silver, or of silver after that standard had been altered to gold, has merely been the reflex of the prices quoted on the great markets of Europe.

Sweden, therefore, can furnish no direct or independent facts concerning the question of the depreciation of silver relatively to gold.

N O R W A Y.

NORWAY.

Mr. Jones to Mr. Erskine.

(Extract.)

British Consulate General, Christiania,
28 November 1876.

THE exceptionally favorable circumstances under which Norway effected its change of standard lessens materially the value of the precedent to any State endeavouring at the present time to avoid the loss attending the depreciation of silver.

Previous to the Law of the 4th of June 1873, the monetary system of Norway was based on a silver standard only, and pieces were struck of the value of 1 and $\frac{1}{2}$ specie dollar, $9\frac{1}{2}$ specie dollars containing 1 Cologne mark of fine silver.

By the said law it was enacted that gold should be substituted for silver as the sole standard of currency, and that from the beginning of the following year the Bank of Norway should exchange its notes for gold, and silver be used for fractional coinage solely.

At the end of the year 1872 the Bank of Norway held silver to the value of 6,750,000 specie dollars (=1,500,000 *l.*), and gold to the amount of 722,000 specie dollars (=160,000 *l.*), the money in actual circulation being represented almost entirely by banknotes.

In consequence of the law, the Bank at once commenced disposing of its surplus stock of silver in order to purchase gold, and had reduced it at the end of the year to 1,535,000 specie dollars (=341,000 *l.*), holding gold at the same time to the value of 7,058,000 specie dollars (=1,568,000 *l.*). The gradual diminution during the following years of the remaining stock of silver can be seen from the following Table :—

STOCK of SILVER in the Bank of Norway at the following Terms :—

							Specie Dollars.
1872.	December	-	-	-	-	-	6,750,000
1873.	June	-	-	-	-	-	6,284,306
"	November	-	-	-	-	-	2,209,515
"	December	-	-	-	-	-	1,619,779
1874.	June	-	-	-	-	-	921,949
"	December	-	-	-	-	-	916,270
1875.	June	-	-	-	-	-	147,382
"	October	-	-	-	-	-	90,189
1876.	June	-	-	-	-	-	52,555
"	September	-	-	-	-	-	49,041

Silver has thus been disposed of to the value of about 1,450,000 *l.*, the greater part of which was sold in London during 1874 at a price varying between 59 *d.* and 59½ *d.* Another portion was exchanged in Denmark against gold, and the remainder was accepted and exchanged against reichsmarks by the Bank of Hamburg, with which the Bank of Norway keeps an open account.

It is calculated that at least 4,820,000 silver kroner (=Sp. d. 1,205,000 *l.*) must be coined to meet the public requirements. Of this sum, silver pieces to the value of Sp. d. 455,500 have been struck up to the present date, for which have been used partly the old silver coinage, and partly the produce of the silver mines at Kongsberg. The amount still required will, it is calculated, be supplied by the old coinage still in circulation. As it will be necessary, however, to issue the new currency quicker than the old can be withdrawn, the required quantity of silver will, in the meanwhile, be supplied by the Kongsberg mines.

The facility with which the demonetisation of silver was effected here is due to the causes already mentioned, the small amount in actual circulation, and the comparatively large proportion held by the National Bank, of which a con-

NORWAY.

siderable part consisted of money formerly coined in Denmark, and which this country (occupied likewise in demonetising its silver) desired to withdraw as speedily as possible from circulation, and willingly consented to receive against gold at the relative proportion of 1 : 15·68.

According to the 15th paragraph of the Act of 17th April 1875, the old coinage still in circulation is to be withdrawn before the expiration of the year 1881, except the pieces representing 12 and 3 skillings (silver), for which the year 1884 is assigned as the term of withdrawal. As yet no order has been issued to call in the old coinage in accordance with the above provision, but as the new currency has been already issued, the old pieces when paid into the public treasuries will be retained and used for the new coinage to the amount of Sp. d. 117,000.

Norway possesses two silver mines. That of Kongsberg (the property of, and worked by, the State) produces annually about 5,000 kilogrammes of fine silver; that of Vinoren yields about 200 kilogrammes of fine silver annually.

I inclose copies of the following documents bearing on the question of the reformed currency:

1. Convention between Sweden and Denmark respecting the adoption of a common currency, concluded 27th May 1873, with the Treaty dated 16th October 1875, by which Norway accedes to this Convention.

2. Law of 27th April 1875, on the subject of the new monetary system.

(signed) *Henry M. Jones,*
Consul General.

PORTUGAL.

PORTUGAL.

(Commercial, No. 2.)

Mr. Crawford to the Earl of *Derby*.

(Extract.)

Her Majesty's Consulate, Oporto,
28 December 1876.

THERE are but few phenomena in the development of the system of Portuguese currency which have any material bearing on the problems involved in the recent fluctuations of the silver market.

Gold is the standard in Portugal, silver subsidiary, and banknotes represent and are redeemable in gold, and in gold alone. The system is decimal, and the unit of value is the rei, an imaginary coin, which at one time was an actual tangible piece of money, but has been in the course of generations so depreciated by successive tamperings with its integrity, that its present value is infinitesimal. The smallest copper coin of the realm, in value less than one farthing, is now represented by five of these nominal reis.

The currency laws of Portugal were, happily for the country, made and fixed at so late a date as 1854, when the soundness of successive Legislative Currency Acts in Great Britain had had full time to be established and exhibited for the benefit of all imitators and copyists.

By a law published on 2nd August 1854, the legal tender in Portugal of the ancient gold coins in circulation is continued. The *peça de ouro* (gold piece) is defined as a coin representing 8,000 reis, and is to be legal tender while it weighs 14·188 grammes, and contains 916 $\frac{2}{3}$ parts of fine gold per 1,000; and the *meia peça* (half-piece) is to represent 4,000 reis, and to weigh and contain half the weight and half the fine gold of the *peça*.

A new

A new gold coinage is by this law to be minted, consisting of—

Coroas de ouro (gold crowns), weighing 17·735 grammes, containing 916 $\frac{2}{3}$ parts of fine gold in the 1,000, and worth 10,000 reis.

Meia coroas, weighing 8·868 grammes, containing 916 $\frac{2}{3}$ parts of fine gold per 1,000, and worth 5,000 reis.

Quintas, weighing 3·547 grammes, containing 916 $\frac{2}{3}$ parts of fine gold per 1,000, and worth 2,000 reis.

Decimas, weighing 1·774, containing 916 $\frac{2}{3}$ parts of fine gold per 1,000, and worth 1,000 reis.

English sovereigns and half-sovereigns are also made legal tender at the rate of 4,500 reis and 2,250 reis respectively; the first to weigh 7·981 grammes, and the latter 3·990 grammes, and both to contain 916 $\frac{2}{3}$ parts of fine gold per 1,000.

Gold may be coined at the Government Mint by any Bank Company or private individual on payment of 1,000 reis per each kilogramme of gold coin minted.

The new silver coins are to be the—

Cinco Tostões (the 5-testoon piece), weighing 12·5 grammes, containing 916 $\frac{2}{3}$ parts of pure silver per 1,000, and worth 500 reis.

Dois Tostões (2-testoon piece), weighing 5 grammes, containing 916 $\frac{2}{3}$ parts of pure silver per 1,000, and worth 200 reis.

Um Tostão (1-testoon piece), weighing 2·5 grammes, containing 916 $\frac{2}{3}$ parts of pure silver per 1,000, and worth 100 reis.

Five thousand reis is the limit of the amount payable in silver in discharge of any single debt, and this limitation must be observed, even though the words “payable in gold or silver” be inserted in the contract.

The privilege of coining silver is exclusively retained in the hands of Government.

The privilege of issuing banknotes was originally confined to the Bank of Portugal and the Banco Commercial do Porto. It is still confined in Lisbon to the Bank of Portugal, but the greater commercial activity of what is virtually the second capital of the kingdom has made it seem necessary to extend the privilege to no fewer than seven banks in Oporto.

All these banks in Lisbon and Oporto have the privilege of issuing notes to the extent of three-fourths of their paid-up capital, with the proviso that they keep on hand an amount in gold or silver equal to one-third of the notes issued.

It is not very much to be wondered at that a currency system is thoroughly successful which borrows not only its leading principles from our own successful one, but the very mintage of our Government establishment to form the far largest part of its gold circulation. The number of English gold coins in circulation (sovereigns and half-sovereigns) is about 200 to every Portuguese gold piece.

The new Portuguese gold coinage being in perfect harmony with the sovereign in assay, and in nominal value relative to weight, and silver being subsidiary to gold, and bearing, in the Portuguese system, the ratio to gold of 14·0962 to 1, it is evident that any disturbing effect upon commerce of an appreciation or depreciation in silver would be unfelt in Portugal, as it has been felt in countries possessing a silver currency or a double currency.

Portugal has, fortunately in the interests of those who desire to get a just view of the working of her currency system, been recently visited by a severe and very distressing financial crisis. It may be interesting to observe how, under the above-mentioned conditions, the country has met and how passed through its difficulties.

Those who believe that the recent excessive depreciation of silver in the markets of the world was due not to any real overabundance of silver, and diminution in the employment of it, but to a vague apprehension that both these causes of depreciation existed to quite unappreciated degrees, and also

PORTUGAL.

that it was in great part due to an actual scarcity of gold* in the channels of commerce, have reason to consider their hypotheses supported by what has occurred in this country.

During the early part of the summer of 1876, the stock of gold began to diminish in the banks of Portugal, of which there are undoubtedly many more than the extension of Portuguese commerce warrants, and this might or might not be simply the result of the bad credit of these establishments. Whatever cause gave rise to it, the exchanges with foreign countries, which are not, as a rule, marked by great fluctuations, began to rise slightly. It began to be difficult to get bills on foreign countries cashed at any price, and severe commercial as well as financial disaster was apprehended.

Under these circumstances the Government adopted two measures of relief, neither of which, it may safely be affirmed, could be contemplated with any feeling short of strong reprobation by those who are well imbued with what generally pass as sound financial principles.

First, by an Order in Council, they announced a two months' prolongation of the date of payment of all bills of exchange, thus creating a two months' jubilee for debtors, and seeking to relieve the monetary pressure by a virtual tax upon creditors.

Secondly, the Portuguese Government imported from London some 2,000,000 *l.* in sovereigns and half-sovereigns, at its own risk and cost, thereby mulcting the Portuguese taxpayer to support the credit of the commercial classes.

These two expedients served their purpose perfectly. The suspension of payments suspended also the fear of general insolvency, which had hung like a *Damocles'* sword over the community, and the injury that was being inflicted by mere panic was immediately allayed. The gold importation was an alleviative measure, which could only have been adopted by a country part of whose currency is coined in a foreign mint. For the slow process of coining the money required to refill the vacuum of gold coin, the Portuguese can adopt the cheaper and quicker process of importation. It is obvious, therefore, that, so far as Portugal is concerned, the employment by the country of our gold currency is a happy and profitable device. Only the patriotic pride of the Portuguese might be expected to be revolted by having the image and superscription of a foreign monarch on the gold on their counters and in their purses; but I have not observed that this is the case.

Again, the use of our mintage might be supposed, at first sight, to be an offence against the comity of nations, if it was not almost certain that every extension of the area of a nation's currency was a distinct benefit to that nation, and, as the transactions of commerce are daily becoming more international, the fluctuations in the British gold market must be distinctly lessened by every such extension, whereby there are, so to say, by so much the more channels and backwaters in which the waves of expansion and contraction have room to move and disperse harmlessly.

The adoption of these two expedients to meet a crisis was perhaps successful, because its employers had comprehended truer and more profound financial principles than have been commonly accepted in commercial circles of normal intelligence, or (more probably) their success in arresting financial complications was due to no superior wisdom, but solely to the tonic effect upon the public constitution of strong and rather unscrupulous measures, as ignorant patients are said to recover better under the effect of medicines which may not be otherwise suitable, if only they are disagreeable enough. A Government which could fly in the face of all accepted doctrine, with such heroic remedies as I have described, might have seemed to possess a "power to save" effective against any possible derangement of the money market.

To return to the general working of the Portuguese currency system, with its borrowed gold coinage and its well-adjusted silver currency, I would observe that the test of such working is to be sought in its effect upon the foreign exchanges of the country.

I apprehend

* I observe that the scarcity of gold was suggested in the late Minute of the Indian Government (Notification of 22nd September 1876, Accounts, No. 3,044) as one among several possible causes of the depreciation in silver. Since then, the connexion between the practical withdrawal by the German Government of 60,000,000 *l.*, the general standstill in the gold supplies, the assumption of gold standards by several States, on the one hand, and, as its consequence, the lowered purchasing power of silver on the other, has been more strongly insisted upon.

I apprehend that I should not now be called upon to furnish this report but for the recent violent fall, and rise and fall again, of the value of the silver rupee, as compared with the English sovereign; and it may be useful to set in contrast the quiet behaviour of the Portuguese exchanges, during a period of severe pressure, with those of India, whose excessive fluctuations during the last year it is not for me to dwell upon.

The following table was drawn up for me at a leading bank of this city, and I can answer for its trustworthiness. It represents the average rate of exchange ruling during each month of the past year for bills at six months upon London, calculated in pence or fractions of a penny per 1,000 reis:—

Average Rate of Exchange during the Year 1876.

	<i>d.</i>		<i>d.</i>
January - - - -	53 $\frac{3}{4}$	July - - - -	53
February - - - -	53 $\frac{1}{4}$	August - - - -	54
March - - - -	53	September - - - -	53 $\frac{1}{2}$
April - - - -	53	October - - - -	53 $\frac{3}{8}$
May - - - -	53 $\frac{3}{4}$	November - - - -	53 $\frac{1}{4}$
June - - - -	53 $\frac{1}{8}$	December - - - -	53 $\frac{1}{8}$

(signed) *Oswald Crawford.*

RUSSIA.

RUSSIA.

Enclosure of Mr. *Stanley's* No. 50, Commercial.

Vice-Consul *R. C. Webster* to Consul-General *G. E. Stanley.*

(Extract.)

British Vice-Consulate, Kherson,
18/30 September 1876.

THE precious metals in circulation in Russia in the early part of 1851 were estimated in the "Petersburg Gazette" (October 12th 1852) at,—

	£.
136,000,000 roubles in silver, at the then rate of exchange of 3 s. 2·40 d. per rouble - - - - =	21,760,000
190,000,000 roubles in gold - - - - =	30,400,000
<u>326,000,000 roubles - - - - =</u>	<u>£. 52,160,000</u>

The present amount of silver in circulation, including the alloyed small change (*billon*), in 10-, 15-, and 20-copeck pieces, may be estimated at 150,000,000 roubles, or say, at the exchange of 7·50, 20,000,000 *l.*

The Siberian mines yield about 550,000 ounces of silver annually, of which one-third is coined at the mints in St. Petersburg and Ekaterinenburg, and the balance is worked up into plate, jewelry, and Circassian ornaments.

Some years ago Russia imported large quantities of silver, purchased in Hamburg and London, and her first lot of alloyed small change, which contained only about 50 per cent. of silver, was coined at Strasburg in or about 1860. At the present moment, however, her imports of bullion, as the following table shows, are inconsiderable, and any import of silver may be reckoned as counterbalanced by that which goes over the Siberian frontier to China.

Imports of Bullion (Gold and Silver Coin and Ingots) into Russia in
1874, 1875, and 1876.

	Roubles.	£.
1874 - - - -	7,337,691, at 7·50 - - =	978,359
1875 - - - -	3,642,619 " - - =	485,683
1876, to 9/21 September - -	2,582,830 " - - =	344,377

RUSSIA.

Exports of Bullion (Gold and Silver Coins and Ingots) from Russia in 1874, 1875, and 1876.

	Roubles.		£.
1874 - - - - -	10,841,223, at 7.50	=	1,445,590
1875 - - - - -	14,678,240 „	=	1,957,099
1876, to 9/21 September	79,978,702 „	=	10,663,827

Consequently, Russia has imported bullion in 1876 to 9/21 September, -

Roubles 4,754,860, or, at 7.50, 633,982 *l.* less than 1874; and
Roubles 1,059,789, or, at 7.50, 141,305 *l.* less than in 1875.

And has exported,—

Roubles 69,136,779, or, at 7.50, 9,218,237 *l.* more than 1874; and
Roubles 65,300,462, or, at 7.50, 8,706,728 *l.* more than 1875.

1,000 standard silver roubles weigh* 1 pood 10 lbs. 60 zolotnicks = (at 36 English lbs. per pood) 45 lbs. 9 oz. avoirdupois, = (at 14 oz. 11 dwts. 15½ grs. troy per lb. avoirdupois) 664 oz. 8 dwts. 2¾ grs. troy; consequently, 1 silver rouble weighs 4 zolotnicks 82¼ doli = 13 dwts. 6.915 grs. troy, of which 83½ parts are pure silver, and 12¾ parts alloy, the Russian standard per pure silver being 96.

As, however, the pood is said to weigh a little over 36 lbs. English, a silver rouble may weigh from half a grain to a grain more than the English weight indicated.

The importation of Russian silver coins of lower standard (billon 10, 15, and 20-copeck pieces) is prohibited.

The value of the rupee was formerly 1 *s.* 11 *d.* The Calcutta quotations this year have been: 22nd June, 1 *s.* 7½ *d.*; 11th July, 1 *s.* 6½ *d.* I am therefore justified in saying that a rupee is worth about one-sixth less than formerly, and the same remark may be applied to the Russian silver rouble.

In 1856 the silver rouble was worth 3 *s.* 2.40 *d.*, or at the rate of *R. S.* 6.25 for 1 *l.* sterling.

I now consider a sovereign to be worth - - - - -	<i>R. S.</i> 7	50
From which if we deduct one-sixth for depreciation - - „	1	25
There remains - - - - -	6	25

the original value of the £. in 1856; therefore one-sixth depreciation in the value of silver represents a rise in the price of gold, if paid for in silver, of one-fifth, or 20 per cent.

Example.

In 1856, 1 *l.* sterling - - - - - = *R. S.* 6 25
Plus one-fifth, or 20 per cent., for depreciation
of silver - - - - - „ 1 25

In 1876, 1 *l.* sterling - - - - - = „ 7 50
Plus 2 per cent. *agio*, as practically there are
no silver roubles in circulation - - - - - „ 15

Present rate of exchange per £. sterling on
London - - - - - *R.* 7 65 paper.

(I may here mention that the basis of all trade with England consists of bills in pounds sterling on London at three months' date.)

To

* 1 Russian pood = 40 Russian pounds; 1 pound = 96 zolotnicks; 1 zolotnick = 6 doli.

To prove my hypothesis, I offer another illustration :—

The intrinsic value of the gold half-imperial was fixed in standard silver roubles at - - - - -	R. S. 5	15
To which now add one-fifth, or 20 per cent., for depreciation of silver - - - - -	„	1 03
Its present worth, in my opinion, in silver roubles	„	6 18
Plus 2 per cent. agio as for the £. sterling - - - - -	„	0 12
Present exchange quotations of half-imperials at St. Petersburg - - - - -	R. 6	30 paper.

I am assured that, for silver roubles, I should be able to obtain only about 2 per cent. agio; but as there is no demand for them, at least in this part of the country, everybody who has a few of these coins keeps them locked up.

The legal tender of Russia is now the *paper silver rouble* in 1-, 3-, 5-, 10-, 25-, 50-, and 100-rouble notes, of which there were in circulation on the 26th July/7th ultimo,—

	R.	R.
		729,908,498
Covered by gold to the amount of - - - - -	138,954,350	
Silver - - - - -	28,157,783	
		167,112,133

The balance - - - Rs. 562,796,365, at 7'65,

= 73,568,152 *l.*, represents the amount the Russian Government has in circulation, in paper notes *uncovered* by bullion.

My authority for the number of paper silver roubles in circulation is a statement published by the Imperial Bank on the 26th July/7th August, and the particulars of the coin and bullion imported into and exported from Russia, during the last 3 years, I found in the "Petersburg Exchange News" of 10th/22nd instant.

In conclusion, I do not think Russia is absorbing any silver from abroad at the present moment. The exact amount of the imports and exports of that metal may be easily obtained from the Chief of the Customs, through Her Britannic Majesty's Consul at St. Petersburg.

(signed) R. C. Webster.

REPORT by Mr. Doria, enclosed in Lord A. Loftus' No. 81, Commercial.

St. Petersburg, 12 December 1876.

THE figures on the accompanying sheet represent in roubles the amount of silver imported to and exported from Russia during the last 5 years (1871 to 1875).

The quantity imported, it may be observed, is considerably in excess of the quantity exported.

During this period just mentioned the largest amount of silver produced from mines in Russia was 952 pounds of 40 Russian lbs.* to the Russian pound, in the year 1871, equivalent in value to 875,220 roubles, about 107,154 *l.*

The minimum production was in the year 1874, and only amounted to 708 pounds (= 644,280 roubles, or 80,535 *l.*).

The quantity of silver employed in the mint for coinage during the last 4 years has, with little variation, maintained the same average amount of absorption, which may be stated slightly under 3,000,000 roubles value per annum (= 375,000 *l.*).

In

* 36 lbs. avoirdupois = 1 Russian pound.

RUSSIA.

In the year 1871, however, there was an increase of the quantity absorbed for coinage of more than 500,000 roubles, since which date the variation in the amount coined has been very inconsiderable.

By comparing the quantity of silver imported in 1873, which represents the maximum imported since 1871, after deduction made of the quantity exported in the same year, with the quantity absorbed by the mint, it is found that there remains a surplus amount of silver of nearly 15,000,000 roubles value.

I have not been able at present to ascertain what quantity of silver is made use of in various articles of silver manufacture, although this information has been promised to me. There is a very considerable quantity annually absorbed in Russia, particularly at Moscow, in the manufacture of various descriptions of silver ornaments and plate.

W. Doria.

STATISTICS regarding SILVER in RUSSIA, 1871 to 1875.

Years.	Imports.	Exports.	Production.		Coinage.	
	Value.	Value.	Weight.	Value.	Weight.	Value.
	<i>Roubles.</i>	<i>Roubles.</i>	<i>Pouids.</i>	<i>Roubles.</i>	<i>Pouids.</i>	<i>Roubles.</i>
1871 - - - - -	1,076,518	813,698	952	857,220	3,905	3,553,550
1872 - - - - -	4,928,478	1,256,642	925	841,750	3,048	2,773,680
1873 - - - - -	18,052,091	355,046	857	779,876	3,275	2,980,250
1874 - - - - -	10,077,492	441,838	708	644,280	3,150	2,866,500
1875 - - - - -	4,720,095	459,106	811	738,010	3,219	2,929,290
Total for Five Years, 1871 to 1875 - - - - -	38,854,674	3,326,330	4,253	3,861,130	16,597	15,103,270

The values are calculated as follows:

Imports and exports of silver coin; at the nominal value.

Imports of bar silver; at the rate of 1,000 roubles per pound.

Exports of bar silver; in conformity with the declarations of the exporters.

Production and coinage; at the rate of 22 roubles 75 copecks the pound (910 roubles the pound), since 22 roubles 75 copecks contain 1 pound of fine silver.

Enclosure of Lord A. Loftus' No. 23, Consular.

Mr. Barrow to Lord A. Loftus.

(Extract.)

British Consulate, Kertch,
10 October 1876.

THERE is no silver at Kertch; nor have I ever seen a single piece during 10 years, beyond the small coins of 20, 15, and 10 kopecks, which, in reality, are no silver at all, or, at any rate, contain a very small portion of that metal. They are termed silver, but the name is *lucus a non lucendo*. Gold coin is equally rare.

(signed) Peter Barrow.

(Commercial, No. 13.)

RUSSIA.

Mr. Carruthers to the Earl of Derby.

(Extract.)

Her Britannic Majesty's Consulate,
Taganrog, 25 September 1876.

IN this portion of the Russian dominions the currency consists entirely of paper, with the exception of copper coin to a limited extent, and the fractional parts of one rouble in silver pieces of 20, 15, and 10 copecks respectively, say about the value of 6 *d.*, 4 *d.*, and 3 *d.* sterling each.

Importation of silver at this place is either altogether nil, or of very insignificant amount.

I have no means of ascertaining the probable absorption of silver in Russia.

(signed) J. F. Carruthers.

UNITED STATES.

UNITED STATES.

Enclosure of Sir E. Thornton's No. 50, Commercial.

Mr. Plunkett to Sir E. Thornton.

Sir, Washington, 17 December 1876.

WITH reference to the Earl of Derby's Circular Despatch of the 2nd September last, of the Commercial Series, instructing you to furnish him with any further particulars that can be procured respecting the yield of the silver mines, and respecting the production and movement of silver in the United States, I have the honour to submit to you a brief summary of the information on this point which has reached Her Majesty's Legation since the date of your last Report to the Foreign Office on the 2nd of October last.

In compliance with instructions from London, Her Majesty's Consul General in New York and Her Majesty's Consuls at San Francisco, Galveston, Portland, Charleston, and Philadelphia have reported to you on this matter; but, except from New York and San Francisco, nothing of importance has been communicated. The Consuls at the other four ports have not been able to learn in their districts any particulars which would be of special interest in this inquiry.

Reports from Her Majesty's Consuls.

Her Majesty's Consul General at New York has furnished two returns, which are hereto annexed:—

Returns from New York.

1st. A table of the imports, exports, and re-exports of silver from the port of New York during the last 20 years.

From this table, it would appear that the exportation of silver was greater in 1873 than in any other year before or since. This fact has been already noticed in the Report of the Select Committee on Depreciation of Silver, and is by them attributed to the coining operations of the United States Government necessitated by the substitution of silver coin for the paper fractional currency.

2nd. A table of the deposits and coinage of silver at the Mints and Assay Offices of the United States for the year ended 30th June 1875.

This part of the subject will be referred to later on.

The best source of information which Her Majesty's Legation can at present get access to is the last report of Dr. Linderman, the Director of the United States Mints.

Report of the Master of the Mint.

Three printed copies of this report are hereto annexed, and I have the honour to summarise a portion of its contents, for your information:—

3.

Amount of Silver produced.—Dr. Linderman reviews the operations of his department for the fiscal year which ended 30th June last, and states that, from the most authentic sources of information, it has been calculated that the domestic production of silver in the United States for the year was \$38,500,000 (7,700,000 *l.*).

At p. 138 of the Blue Book (Report on the Depreciation of Silver), the total domestic

UNITED STATES. domestic production of silver for 1874 and for 1875 is set down at \$32,000,000 (6,400,000 l.) for each of those years. It would therefore appear that the production for the last fiscal year is the largest ever yet obtained in the United States, although it falls short by \$1,500,000 (300,000 l.) of what it was estimated by Dr. Linderman as likely to amount to (Blue Book, p. 133).

Amount of Silver on hand.—The following returns, which are compiled from Dr. Linderman's figures, show the total amount of silver coin and bullion calculated to be on hand in the United States on the 30th of June last:—

	\$	£.
Balance of Silver on hand, 30 June 1875	12,000,000	2,400,000
Importations during year	7,942,000	1,588,400
Product of American mines	88,500,000	7,700,000
TOTAL	\$ 58,442,000	£. 11,688,400
From which deduct—		
Exportations, \$25,329,000 (5,065,800 l.)	28,329,000	5,665,800
Employed in manufactures, \$3,000,000 (600,000 l.)		
Balance on hand, 30 June 1876	\$ 30,113,000	£. 6,022,600

Comparison with previous Year.—This table shows an increase of \$18,113,000 (3,622,600 l.) in the amount of silver held in the United States over what it was twelve months previously.

In the returns laid before the Committee of the House of Commons the silver employed in manufactures in the United States, in the year ending 30 June 1875, was estimated at \$6,000,000 (1,200,000 l.), an amount which the Committee commented upon as being out of proportion to the quantities of silver held for similar purposes in other countries. Dr. Linderman, it will be noticed, now estimates this class of silver at only \$3,000,000 (600,000 l.).

Imports and Exports of Silver.—The full returns of the importation and exportation of silver during the last fiscal year are given at page 40 of the Report.

The chief points are as follows:—

	\$	£.	s.
Exports—Bullion (domestic)	15,240,344	3,048,068	16
„ Coin (domestic)	5,366,590	1,073,318	—
„ Bullion (foreign)	15,995	3,199	—
„ Coin (foreign)	4,706,323	941,264	12
	\$ 25,329,252	£. 5,065,850	8
<hr/>			
Imports—Bullion	1,056,949	211,389	16
„ Coin	6,885,795	1,377,159	—
	\$ 7,942,744	£. 1,588,548	16

Excess of exportation over importation of silver for year ended 30 June 1876, \$17,386,508 = 3,477,301 l. 12 s.

For the year ended 30 June 1875 the exports and imports of silver were—

	\$	£.	s.
Exports	25,151,165	5,030,233	—
Imports	7,203,924	1,440,784	16
Excess of Exportation	\$17,947,241	£. 3,589,448	4

It would result from the above tables that the net exportation for last year was less by \$560,733 (112,146 l. 12 s.) than the net exportation for the previous year.

Comparison of last 5 Years.—The following table, compiled from the Blue Book

Book and from Dr. Linderman's Report, shows the excess of exports over imports of silver during the past five years:— UNITED STATES.

Years ending	\$	£.	s.
30 June 1872	25,302,543	5,060,508	12
" " 1873	26,953,869	5,390,773	16
" " 1874	23,636,216	4,727,243	4
" " 1875	17,947,241	3,589,448	4
" " 1876	17,386,508	3,477,301	12
Total for 5 Years	\$ 111,226,377	22,245,275	8

These figures show a regular annual diminution in the net exportation of silver from the United States since 1873, and harmonise completely with the returns of the movement of silver at the port of New York furnished by Mr. Archibald.

Exportation from San Francisco.—The exportation of silver from San Francisco to China and Japan, both on British and on American account, has been very active for some months past, and the price realised at San Francisco has been above the London rate. Bullion formerly went from San Francisco to China by way of London, whereas now there is much saving of time and of expense in sending it direct *via* Yokohama or Hong Kong. As a proof of his assertion that San Francisco is now on a par with London with respect to the Oriental markets, Dr. Linderman gives the following Table of the shipments of silver from San Francisco to China alone during the period from 1 January to 26 October of this year:—

Trade dollars	\$ 4,255,378
Mexican dollars	1,820,040
Fine silver bars	2,055,575
Total	\$ 8,130,993
Or	£. 1,626,198 12 s.

Dr. Linderman gives the above Table only in a footnote at page 7, and does not quote his authority for the figures. It is difficult to reconcile them with the following Return, received from Mr. Consul Booker, of the exports of silver by sea from San Francisco during the period between the 1st of January and 1st of October 1876—*i.e.*, a period of only 26 days shorter than the period comprised in Dr. Linderman's Return, which professes to give the exportation to China alone.

Mr. Booker observes, with reference to this Return, that, to arrive at more exact values, about 5 per cent. should be added to the coin shipments, and about 10 per cent. to the shipments of silver bars.

TABLE of SILVER EXPORTS by Sea from San Francisco, 1 January to 1 October 1876.

To China,—Trade dollars	\$ 3,506,346
Mexican dollars	1,175,400
Silver bars	1,540,432
To Japan,—Mexican dollars	212,311
Silver bars	26,883
To Honolulu,—Mexican dollars	32,000
To Germany,—Silver bars	92,654
To France,—Silver bars	12,234
To Central America,—Trade dollars	32,000
Mexican dollars	500
Silver coin	1,630
Total	\$ 6,632,390
Equal to	£. 1,326,478

Importation.—Mr. Booker writes on the 28th of November that the importation of silver into San Francisco, during the period 1 January to 1 October of this year, amounted to \$ 2,587,000 (517,400 l.), of which nine-tenths came from Mexico, and the balance from Central and South America.

UNITED STATES.

Reasons for activity of Silver Market at San Francisco.—In a letter dated 3rd of October, and addressed to Dr. Linderman, Mr. Davis, of the mint at San Francisco, gives three reasons for the special activity of the silver market there:—

- 1st. An increased trade with China in teas and silks.
- 2nd. Remittances direct to China on British account.
- 3rd. The fall in the value of silver in London has necessitated economy in handling.

He considers, however, that the higher rates now ruling at Hong Kong, in consequence of large arrivals of silver from London, India, and San Francisco, will check any larger and further shipments of silver from San Francisco for European or Chinese account, and he considers that the export of trade dollars and silver hereafter will be limited to the local requirements to cover importations, which, as the silk and tea seasons are now nearly over, cannot be very large for this year.

Mr. Davis adds that most of the silver sent from San Francisco was on British account, the English merchant settling with his Chinese creditor by directing his agent in San Francisco to ship silver direct to China, and thus saving from 1 to 2½ per cent. on the transaction.

Trade Dollars.—With regard to the exportation of trade dollars, the United States' Minister at Peking, in a despatch which has lately been published, writes rather despondingly.

He says:—

"The trade dollar, as I believe, was coined to afford another outlet for the silver produced by our mines. It was not supposed that it would become largely current at home, but it was intended for shipment to China, where it was thought it might take the place of the Mexican dollar. In my Trade Report of last year I spoke of the difficulty of introducing it into Northern and Central China. There are not 500 of the new coins in circulation north of Foo-Chow. In Southern China it has not displaced the Mexican, or found a market to any great extent. I doubt whether it ever can come into general or extensive circulation."

Mr. Seward's long residence and extensive experience in China make his opinion on these matters of great value, and I have therefore thought the above extract from his despatch would be interesting to you.

Sources of Silver Production.—The total domestic silver bullion production of the United States in the last fiscal year has been stated to be \$38,500,000 (7,700,000 l.). It will now be of interest to consider the local returns on which this estimate appears to have been based.

They will be found at pages 52-57 of Dr. Linderman's Report, but the following extracts will not be out of place in this review of it:—

STATEMENT of the Total Bullion Production of the State of Nevada for the Twelve Months commencing 1 July 1875, and ending 30 June 1876.

County.	Weight.		Gross Value.		Total Value.	
	Tons.	lbs.	\$	c.	\$	c.
Eureka - - - - - ores	56,340	1,441	2,197,616	02	2,197,616	02
Elko - - - - - ores	6,434	1,036	521,947	07	521,947	07
Esmeralda - - - - - ores	14,761	450	1,001,329	10	1,002,129	10
Do. - - - - - tailings	200		800			
Humboldt - - - - - ores	2,173	1,968	101,740	43	143,489	53
Do. - - - - - tailings	6,161		41,749	10		
Lander - - - - - ores	7,055	1,092	908,515	13	908,515	13
Lincoln - - - - - ores	25,101	1,557	1,322,338	22		
Do. - - - - - tailings	8,543		37,697	18	1,360,035	40
Lyon - - - - - ores	236		3,688	62		
Do. - - - - - tailings	75,532		429,949	64	433,638	26
Nye - - - - - ores	14,025	1,288	622,293	09		
Do. - - - - - tailings	3,341	1,340	51,361	04	673,654	13
Storey - - - - - ores	544,773	1,480	33,618,519	64		
Do. - - - - - tailings	18,293		165,635	91	33,784,155	55
White Pine - - - - - ores	12,816	993	715,344	28		
Do. - - - - - tailings	691		10,409	96	725,754	24
GRAND TOTAL - - -	*796,481	645	41,750,934	43	41,750,934	43

The

* The detailed figures amount to 1,440 lbs. less than the total here given.

The above total of \$41,750,034 (8,350,000 l. in round numbers) represents the total return of both gold and silver, and no separate return is given of the value of silver alone. But, if we take the usual ratio which silver bears to gold in Nevada, viz., 55 of the former to 45 of the latter, we may calculate the net silver production of Nevada for last year to have been about \$22,962,500 (4,592,500 l.).

Mr. Consul Booker, in his despatch already alluded to, reports that he had been informed that the probable production of silver in Nevada for this year would amount to \$28,000,000 (5,600,000 l.).

Probability of diminished Production.—He expects, however, that there will be a falling-off in the produce of the mines unless new discoveries are made, as two or three of the mines which have yielded largely have been rapidly diminishing their product.

Dr. Linderman gives the replies addressed to him from various States, with estimates of their gold and silver production.

From those returns I have condensed the following Table of the Production of Silver for the past year:—

	Dols.	£.	s.	d.
Nevada - - - - -	22,962,500	4,592,500	—	—
Colorado - - - - -	3,130,000	626,000	—	—
Montana - - - - -	1,132,976	226,595	4	—
Arizona - - - - -	500,000	100,000	—	—
Oregon - - - - -	6,000	1,200	—	—
Washington Territory - - - - -	Nil	Nil	—	—
Utah Territory - - - - -	5,829,500	1,165,900	—	—
New Mexico - - - - -	425,329	85,065	16	—
TOTAL - - - - -	33,986,305	6,797,261	—	—

The above falls short by more than \$4,500,000 (900,000 l.) of the total production as given by Dr. Linderman, and already quoted. But in this Table no account is taken of the smaller sources of silver production which, in the aggregate, must contribute a considerable sum.

Estimate of Production by the "Times" Correspondent.—In a careful, and apparently trustworthy, review of the silver question which has been lately published in the "Times," from a correspondent at San Francisco, the total production of silver in the United States for 1876 is computed not to exceed \$28,000,000 (5,600,000 l.).

The writer goes on to say:—"There is not the slightest doubt that the silver product of the United States has all along been exaggerated, and those who have access to the best sources of information consider 24,000,000 ounces of fine silver a full estimate, and one, moreover, that, with the amplest knowledge of the prospects of further production, they think is not likely to be exceeded in future from the present known sources."

There can be no doubt that the production has been formerly very much over-estimated, and even the best information now obtainable must be accepted with great caution; but if it be true that over \$30,000,000 (6,000,000 l.) of silver were produced in this country in the twelve months from 1 July 1875 to 30 June 1876, as is stated by Dr. Linderman, it seems difficult to believe that the estimate of \$28,000,000 for the whole year 1876 is not too low.

At the same time, it is fair to add that Dr. Linderman himself, at page 22 of his Report, expresses his fear that the increased production of last year will not be permanently maintained.

Coinage of Silver.—Having seen the amount of silver produced in the United States, and the returns of imports and exports for the last year, the next point of interest will be to consider what quantity of silver has been coined, and also, as far as possible, to discover what quantity is likely to be required hereafter for the use of the mint.

Treasury Report.—The Report of the Secretary of the Treasury which has just been laid before Congress states, that during the fiscal year ended 30 June

UNITED STATES. 1876, silver coinage to the amount of \$19,126,502 (3,825,300 l. 8s.) was struck, of which amount \$6,132,050 (1,226,410 l.) were trade dollars.

Class of Coins struck.—The following Table, supplied by Dr. Linderman, will show the quantity and class of silver which has so far been coined:—

STATEMENT of Trade-Dollar and Subsidiary Silver Coinage to the Close of the Fiscal Year ended 30th June 1876, at Mints in *Philadelphia, San Francisco, and Carson.*

PERIOD.	Trade Dollar Coinage.	Subsidiary Silver Coinage.				Total Subsidiary Silver Coinage.	Total Silver.
		Half-Dollar.	Quarter-Dollar.	Twenty Cents.	Dimes.		
	<i>Dols.</i>	<i>Dols. c.</i>	<i>Dols. c.</i>	<i>Dols. c.</i>	<i>Dols. c.</i>	<i>Dols. c.</i>	<i>Dols. c.</i>
1 April to 30 June 1873.	- -	467,000 00	91,875 00	- -	107,115 00	665,990 00	665,990 00
Fiscal year ended—							
30 June 1874 -	3,588,900	1,488,930 00	458,515 50	- -	497,255 80	2,394,701 30	5,983,601 30
30 June 1875 -	5,697,500	2,853,500 00	623,950 00	5,858 00	889,560 00	4,372,868 00	10,070,368 00
30 June 1876 -	6,132,050	4,985,525 00	4,106,262 50	263,560 00	3,639,105 00	12,994,452 50	19,126,502 50
TOTAL - -	15,418,450	9,744,955 00	5,280,603 00	269,418 00	5,133,035 80	20,428,011 80	35,846,461 80

Under the authority for the issue of silver coin granted by the Act of 22 July 1876, the Secretary of the Treasury, in addition to redeeming fractional currency whenever presented for that purpose, has also issued silver coin in exchange for legal-tender notes as rapidly as the coinage would permit.

Between the 17th of April and the 30th of October of this year \$22,096,712 (4,419,342 l. 8s.) of silver coin has been issued, of which amount there has been, for fractional currency redeemed and destroyed, \$12,953,259 (2,590,652 l.).

The demand for silver coin for circulation, though growing less urgent, still continues equal to the capacity of the mints to supply it. Until this demand shall have ceased, coining operations will be continued as rapidly as practicable to the limit authorised by law.

Suggestions of Secretary of the Treasury.—The Secretary of the Treasury recommends that this limit should be raised, and that silver coin should be struck to the extent of \$80,000,000 (16,000,000 l.), and be made legal tender for sums not exceeding \$10 (2 l.). At present, in virtue of the Act of 1873, silver is legal tender for \$5 only (1 l.).

Question of the Double Standard.—Both Mr. Morrill and Dr. Linderman enter at length into the question of how far it might be advisable to coin legal-tender silver dollars under a double standard, and both come to the conclusion that gold should be the sole standard for this country.

Gold Standard.—The Secretary of the Treasury contends “that the coin payment to which the faith of the nation was pledged in 1869 was gold, and not silver; and that any other view of the question, no matter how plausible it may be, would be regarded with ill-favour, and its effect would be prejudicial to the public credit.”

Extended use of Silver.—At the same time, Dr. Linderman considers that the use of silver coins might be materially increased, by raising the amount for which they are legal tender to \$10 for the ordinary silver dollar of 412½ grains, and to \$50 or \$100 for the trade dollar of 420 grains.

International arrangement suggested.—He is also of opinion that, sooner or later, the question of the relative values of silver and gold must be referred to an International Convention, and, if the result of such Convention should be the adoption for a term of years of a double standard, on a common basis, by Great Britain and the principal countries of Europe and America, it would probably be

be to the advantage of the United States to assent to the same. "In the meantime," he says, "the true policy of this country is to adhere to her present position, with such modifications as will best promote her home interests, mining industries, and internal trade, by giving silver the largest possible scope as a limited tender, and for change purposes, compatible with its relation to gold, and, at the same time, increase its commercial value, by promoting its exchanges with India and China."

Silver Commission now sitting.—A Special Commission has been engaged for some months studying the silver question, and its Report, which is looked forward to with anxiety, will probably be published in the course of next month.

Action in Congress.—The House of Representatives, however, has not thought fit to wait till this Commission has finished its labours, and has just passed, by a majority of 167 votes to 53, a Bill authorising "the coining, at the Mints of the United States, of the silver dollar of 412½ grains standard silver to the dollar, as provided for in the Act of 1837, which dollar shall be a legal tender for all debts, public and private, except where payment of gold coin is required by law."

In consequence of the great press of other business before the House, only two hours were allowed for the discussion of this important measure; but as it had been already mooted last Session, the question has been practically before the public for some time, and has been the subject of discussion during the recess in almost every part of the Union.

The Bill in its amended form was supported by Mr. Bland of Missouri, Mr. Durham of Kentucky, Mr. Willard of Michigan (who is a Member of the Special Commission above referred to), Mr. Sanders of Indiana, Mr. Philips of Kansas, Mr. Cannon of Illinois, and Mr. Kelly of Pennsylvania. It was opposed by Mr. Karson of Iowa, Mr. Chitenden of New York, Mr. Garfield of Ohio, and Mr. Hewitt of New York.

Line of argument adopted in Congress.—The chief argument used by the supporters of the Bill was that gold was over appreciated by the fact of the demonetisation of silver, and that the United States as a large producer of silver ought to do all she can to prevent the further depreciation of that metal. They, moreover, claimed that, silver being at present cheaper than gold, the nation as well as individuals had a right to pay their debts in the cheaper metal when not specially bound to pay in gold.

The adversaries of the Bill, on the other hand, contended that it is not advantageous for the United States, at a moment when her exports exceed her imports by over \$79,000,000 (15,800,000 £.), to give her foreign debtors the power of paying off the balance in a cheaper metal; and they also contended that the ratio of gold to silver being so variable, it was useless to attempt to regulate it by law. Such legislation, they maintained, must be injurious to the nation generally, and would be advantageous only to individual bullion brokers, who would speculate on the fluctuations.

As this Bill has still to be submitted to the Senate, and as the Report of the Special Commission will probably be published before the Senate will have time to consider it, and as that Chamber will be greatly influenced in its decision by the view taken of the matter by the Commission, I will not enter into any detailed account of the debate in the House of Representatives. It elicited no new facts or arguments of interest, except, indeed, the stupendous assertion of one of the supporters of the Bill, that the United States produced \$75,000,000 to \$90,000,000 (15,000,000 £. to 19,000,000 £.) annually of silver.

I have, &c.
(signed) F. R. Plunkett.

IMPORTS, EXPORTS, and RE-EXPORTS of Silver Coin and Bullion of the Port of *New York*
for the last Twenty Years.

Years ending 30th June.	Imports.			Exports.			Re-Exports.		
	Silver Coin.	Silver. Bullion.	Total.	Silver Coin.	Silver Bullion.	Total.	Silver Coin.	Silver Bullion.	Total.
	<i>Dols.</i>	<i>Dols.</i>	<i>Dols.</i>	<i>Dols.</i>	<i>Dols.</i>	<i>Dols.</i>	<i>Dols.</i>	<i>Dols.</i>	<i>Dols.</i>
1856 - - - -	587,511	40,115	627,626	- - -	- - -	- - -	521,643	- - -	521,643
1857 - - - -	782,822	147,190	930,012	- - -	- - -	- - -	2,214,926	- - -	2,214,926
1858 - - - -	689,533	271,027	960,560	- - -	- - -	- - -	- - -	- - -	- - -
1859 - - - -	389,092	180,847	569,939	- - -	- - -	- - -	- - -	- - -	- - -
1860 - - - -	853,255	71,935	925,190	- - -	- - -	- - -	6,353,027	18,464	6,371,491
1861 - - - -	808,627	549,373	1,358,000	- - -	- - -	- - -	1,461,682	- - -	1,461,682
1862 - - - -	522,683	148,315	670,998	- - -	- - -	- - -	172,802	- - -	172,802
1863 - - - -	533,068	3,058	536,126	- - -	- - -	- - -	1,153,277	- - -	1,153,277
1864 - - - -	256,849	41,928	298,777	1,632,532	38,452	1,670,984	194,438	- - -	194,438
1865 - - - -	135,240	7,658	142,898	1,241,154	181,700	1,422,854	128,423	- - -	128,423
1866 - - - -	574,016	28,779	602,795	976,705	2,633,367	3,610,072	794,389	26,500	820,889
1867 - - - -	969,305	11,861	981,166	1,830,230	8,892,918	10,723,148	1,828,243	18,939	1,847,182
1868 - - - -	919,682	84,335	1,004,017	1,450,168	8,208,455	9,658,623	2,436,376	20,000	2,456,376
1869 - - - -	1,479,284	41,948	1,521,232	736,012	6,187,931	6,923,943	2,880,716	213,818	3,094,534
1870 - - - -	3,293,649	40,636	3,334,285	3,042,894	2,531,132	5,574,026	5,794,541	- - -	5,794,541
1871 - - - -	5,245,848	7,309	5,253,157	2,106,875	14,193,944	16,300,819	8,716,695	- - -	8,716,695
1872 - - - -	970,016	10,271	980,287	1,548,327	18,902,556	20,450,883	3,715,090	141,241	3,856,331
1873 - - - -	6,450,034	19,904	6,469,938	1,511,097	24,795,067	26,306,164	7,128,926	68,511	7,197,437
1874 - - - -	2,986,130	13,044	2,999,174	1,991,876	20,210,469	22,202,345	2,531,728	25,000	2,556,728
1875 - - - -	2,250,840	330,608	2,581,448	579,593	16,909,687	17,489,280	1,197,491	10,955	1,208,446
Total for 20 Years, 1856 to 1875 - - - \$.	30,607,484	2,050,141	32,747,625	18,647,463	123,685,678	142,333,141	49,224,413	543,428	49,767,841
= in sterling - £.	6,139,497	410,028	6,549,525	3,729,492	24,737,136	28,466,628	9,844,882	108,686	9,953,568

120.

N 2

DENOMINATION—SILVER.	MINT UNITED STATES.						TOTAL.			
	Philadelphia.		San Francisco.		Carson.					
	Pieces.	Value.	Pieces.	Value.	Pieces.	Value.				
	No.	Dols.	No.	Dols.	No.	Dols.				
Trade Dollars	-	-	476,800	476,800	3,379,000	3,379,000	1,841,700	1,841,700	5,697,500	5,697,500
Half Dollars	-	-	4,415,000	2,207,500	958,000	479,500	334,000	167,000	5,707,000	2,853,500
Quarter Dollars	-	-	2,008,800	500,950	492,000	123,000	-	-	2,495,000	623,950
Twenty Cents	-	-	11,000	2,200	15,000	3,000	-	658	27,316	5,853
Dimes	-	-	4,580,600	458,060	3,430,000	343,000	1,316	88,500	8,895,600	889,560
TOTAL SILVER	-	-	11,487,200	3,645,510	8,274,000	4,327,000	3,062,016	2,097,858	22,823,216	10,070,368

UNITED STATES.

Enclosure of Sir *E. Thornton's* Commercial Despatch, No. 11, of
27th February 1877.

MEMORANDUM by Mr. *Plunkett* on the Silver Question and on the modes
proposed for resuming Specie Payments in the United States.

Washington, 27 February 1877.

Silver Committee has not published its Report.—No Report has yet been published by the Special Committee appointed to investigate the Silver Question.

Senate has so far done nothing respecting remonetisation of Silver.—On the 16th instant, Senator Logan, of Illinois, moved that the Senate do take up the Bill for the remonetisation of silver, which was passed by the House of Representatives in the month of December; but, after a very short debate, the further consideration of the question was postponed till the 20th; on that day the Senate was engaged in the joint convention for the counting of the electoral vote, and no further notice has so far been taken of Mr. Logan's proposal.

Senator Bogg's views.—In the brief discussion which took place on the 18th instant, Senator Bogg, of Missouri, who is a member of the Silver Commission, took occasion to state that the Report had been completed, and would have been submitted to the Senate before then, if it had not been for the difficulty of getting it printed. He added his opinion that the silver dollar should be restored, but he desired to restore it in such a manner as to produce a benefit to trade and industry, and not an injury. He did not, however, add any further explanation as to how this end was to be attained.

There will be two Reports.—Although the public does not yet know the exact nature of the conclusions at which the Committee has arrived, it seems to be generally understood that there are two Reports. The majority Report will recommend the remonetisation of silver and the adoption of the double standard; the minority Report, which is signed by Mr. Boutwell, who was Secretary of the Treasury from 1869 to 1873, will urge the maintenance of the single gold standard, so long as other commercial Powers, and especially Great Britain, refuse to abandon it.

Reports will soon be published.—These two Reports will probably be published in the course of the next few days; but the evidence taken before the Committee is so voluminous that it will take some time to print, and its publication will have to be postponed until the Congressional printers, who are at present overwhelmed with work, have leisure to attend to it.

Although these Reports have not been yet published, I am able to give on very good authority the following synopsis of the minority Report.

Précis of the Minority Report.—Mr. Boutwell gives it as his deliberate opinion that, at the present moment, it is not expedient for the United States Government to coin a silver dollar with the view of making it legal tender for all purposes except such as are otherwise specially provided for by law or contract. He, however, thinks it would be advisable for the United States Government to invite the commercial nations of the world to join in a convention, for the purpose of considering whether it is wise to provide by treaties and concurrent legislation for the use of both silver and gold by all such nations upon a fixed relative value; and, finally, he is of opinion that, until such an agreement between the Government of this country and the Governments of foreign commercial nations can be effected, the United States should pursue the existing policy with regard to the resumption of specie payments. The arguments which he adduces in favour of his views may be summed up as follows.

Even in countries where silver is used as a coin, and is endowed with the quality of being a legal tender, it is yet an article of commerce, and its value in all foreign transactions is measured by gold, and tested by the gold standard, gold being the only universal standard of value, all other articles are tested by it; and, however the standard may change, yet so long as it is accepted as the standard, the relation which other articles, including silver, bear to it is one of fact, and all theories with regard to values must conform to the fact. No
country

country can maintain two standards of value in actual use at the same time; and in every country which has adopted the double standard, that metal has been used to the exclusion of the other which was overvalued as a coin as compared with the value of the bullion contained in the coin when tested by its market price in other countries. Consequently, in every country having the double standard, the metal which is overvalued as coin has been used to the exclusion of the other.

At present, a United States gold dollar will purchase a larger quantity of pure silver than is contained in the silver dollar of $412\frac{1}{2}$ grains. The superior value of the gold dollar would prevent its use. Gold coin and bullion would be exported, and silver be sent back to this country in exchange, to be here coined and introduced into the circulation of the United States. All the discarded silver of every other country would come here, and by depressing its general value would furnish another argument against its remonetisation by the other commercial nations of the world.

The first necessity of a commercial people is that their standard of value should be of itself accepted by other commercial nations, for one of the chief uses of the precious metals as a standard of value is for the purpose of liquidating balances with other countries.

As long as silver is merely an article of commerce in Great Britain, where the bills of America due to other countries are finally adjusted, the use of silver as a standard in this country will not produce the results which ought to follow from a resumption of specie payments.

Mr. Boutwell does not believe that the Act of the British Parliament making gold the sole standard of value was the foundation of the commercial and financial pre-eminence of England; he considers this pre-eminence to be principally due to her policy in encouraging manufactures and fostering and extending her maritime power. But, whatever be the cause, London is now the clearinghouse of the world, and as balances there must be settled in gold, other commercial nations should make that metal the sole standard of value, unless England can be induced to accede to a general arrangement securing the adoption of the bimetallic standard.

As regards the effect which the remonetisation of silver now would have on the credit of the Government abroad, he considers that, as gold was the only coin in circulation at the time of the passing of the Act in 1862, and as the interest of the debt has been uniformly paid in gold, public creditors may well claim that they shall continue to be paid in the coin authorised and in circulation when the Act of 1862 was passed. The adoption of payment in silver, instead of in gold as heretofore, would damage the public credit to a far greater extent than would be covered by the possible immediate gain by paying in the cheaper metal. As regards only the operations of internal commerce, Mr. Boutwell considers that a paper currency is about as good as a silver one.

While acknowledging that it might be desirable to secure the consent of the commercial nations to the use of the two metals, he considers no evil will arise to the United States from adhering to the existing policy in regard to gold and silver. The United States are now on a gold standard, and although the paper currency of the country is still depreciated to the extent of about 5 per cent., there has on the whole been a constant improvement in its value since the close of the war. Trade has been bad in America, as it has been also in Europe and in the East, but now it shows some small signs of recovering, and if the exports continue to exceed the imports in the same proportion as they did last year, paper money will approach still more to par with gold. For commercial purposes this paper is as good as silver of the proposed standard would be, for each is only of use in so far as it can be exchanged for gold.

Mr. Boutwell concludes by expressing his opinion that it will be wise for the commercial nations of the world to agree upon the use of both silver and gold as a standard, and for all purposes, the coinage to be free in each country and unlimited in amount; and he expresses, also, his belief that the use of the two metals in the manner indicated will furnish a more unvarying basis for business than can be obtained by the use of either metal alone. The evidence taken before the Committee would tend to show an increasing sentiment in Europe in favour of the remonetisation of silver. If the United States were alone to undertake such an operation, they would so far depreciate the value of silver as to furnish a good reason against the adoption of the double standard by the rest of

UNITED STATES.

the world; Therefore, the restoration of silver as a standard should be postponed until an effort shall have been made to secure the cooperation of the principal commercial nations.

Reason why nothing can be done at present.—The opinions of Mr. Boutwell will probably have considerable weight whenever the time comes for legislative action; but now nothing can be done; there are only five days left to the close of the session, and the attention of Congress is too much engrossed in the dispute for the Presidency to have any time to devote to a dry question of finance.

Review of some of the Schemes for Resumption.—Although not of immediate importance, for everything will depend on the views of the new Secretary of the Treasury, whoever he may be, it may interest Her Majesty's Government to have a brief review of some of the opinions known to have been submitted to the Committee as to the easiest modes of resuming specie payments.

Proposal to debase the Dollar of Silver.—In order to establish and maintain as far as possible the ratio between gold and silver of $15\frac{1}{2}$ to 1, a ratio without which it has been contended that the bimetallism can not be realised, some of the witnesses before the Committee have recommended the issue of a debased silver dollar, worth exactly two of the present half-dollars issued for fractional currency, instead of continuing to coin the present silver dollar of $412\frac{1}{2}$ grains.

Proposal to raise the Dollar of Gold.—Others of those witnesses have taken the opposite view, and recommended that, instead of debasing the silver dollar, so as to make it fit in (at the ratio of $15\frac{1}{2}$ to 1) with the present gold dollar, the title of $412\frac{1}{2}$ grains 9-10ths fine, should be maintained, and the weight of the gold dollar raised to 26.61 grains 9-10ths fine, instead of 25.8 grains as at present.

It is not yet known which plan the Committee has adopted, and as Mr. Bogg informed the Senate that they have not yet prepared any Bill to be submitted to Congress, it would appear as if the question had not yet been definitively settled.

General Desire to return to Specie Payments.—The early resumption of specie payments is almost universally desired, and the sooner it can be brought about the better it will be for the general prosperity. The following extract from one of the leading New York Journals, of about a fortnight ago, seems to express the opinion of the public on this point, although it is probably too hopeful as regards the immediate revival of trade:—

"The fact that gold dropped yesterday to 104 $\frac{1}{4}$ proves the sagacity and timeliness of President Grant's purpose to send a message to Congress recommending legislation looking to the immediate resumption of specie payments. We cannot expect in many years a recurrence of the highly favorable combination of circumstances, which invite the country to take now the final step towards a sound currency. The step is so short that it would be attended with no perceptible disturbance of values. Business is about to revive, and as soon as the great mass of idle labourers find employment, there will be an enlarged demand for commodities and a consequent improvement in prices. If we resume specie payments before this advance sets in, the rise will be normal and healthy, and the rehabilitated business of the country will rest on a secure foundation. But if we defer resumption until prices shall have gone up, we cannot resume afterwards without a financial shock. * * * Prices are now at a very low ebb, below even the specie level in active and prosperous times, and are sure to advance, whether we resume or not. Hereafter, we cannot resume without putting a pressure on the whole community by diminishing the money value of every man's property."

Mode of Resumption recommended by the President.—The plan recommended to Congress by the President in his Message of the 3rd instant, referred to in the above article, was that advantage should be taken of the great balance of trade which there is at present in favour of this country (the exports of the past year exceeded the imports by about 37,177,000 L.), to issue 4 per cent. bonds, with 40 years to run before maturity, to be exchanged for legal tender notes whenever presented in sums of \$50, or any multiple thereof, the whole amount of such bonds not to exceed \$150,000,000. In order to encourage the demand for such bonds, the President recommended that they be available for deposit in the

the

the United States Treasury for banking purposes under the various provisions of the law relating to national banks. He suggested, moreover, that the national banks should be required to retain a certain per cent. of the coin interest received by them from the bonds deposited with the Treasury to secure their circulation. He also recommended the repeal of the Joint Resolution, approved 22 July 1876, whereby the amount of subsidiary silver coin is limited to \$50,000,000.

This proposal would require an accumulation of only half the amount of coin which the Secretary of the Treasury, under the Act of 1875, may be called upon to have in hand for the redemption of "greenbacks" on and after the 1st of January 1879.

Views of the Secretary of the Treasury.—In his annual report presented to Congress at the commencement of this Session, Mr. Morrill pointed out the very serious inconveniences which might arise from the obligation to collect such a large amount of coin, and he suggested that, if Congress would decide on resuming specie payments at once, instead of waiting for another two years, when circumstances may not be so favorable to this country as they now are, half the amount would suffice to meet all probable demands for specie.

It would, therefore, appear that the proposal of the President is a development of the ideas hinted at in Mr. Morrill's Report* of 4th December last, but although meeting with a general approval in the press and in the country, Congress has not taken any steps in the matter, and there is no prospect whatever of anything being done this Session.

Plan for Resumption without Special Legislation.—The following extract from the "New York Herald" of the 14th instant would show that, even without any special action on the part of Congress, there is still a mode by which resumption of specie payments might take place.

"The Secretary of the Treasury has full power, under the Act of 1875, to sell any amount of $4\frac{1}{2}$ per cent. bonds at not less than par in coin, which may be necessary for redeeming the 'greenbacks.' The $4\frac{1}{2}$ per cent. bonds are slightly above par, and it is contended, with a considerable show of reason, that he could dispose of them for 'greenbacks,' provided the 'greenbacks' were taken at their coin value. What the President recommended was a law authorising their exchange for 4 per cent. bonds without regard to the premium on gold. It would answer almost equally well to take them at their gold value in exchange for $4\frac{1}{2}$ per cent. bonds. This would indeed swell the interest account somewhat, but not to any large extent, because a very moderate withdrawal of 'greenbacks' would bring them to par. The withdrawal of 50,000,000 would probably suffice, and half of 1 per cent. interest on that amount would be a bagatelle in comparison with the incalculable advantages of a sound currency. It is useless, however, to discuss the subject in detail at present, for the outgoing secretary of the Treasury cannot be expected to take the subject in hand. But when the new administration comes into power, it will be its duty to examine its powers under the Resumption Act, and determine whether it cannot restore the currency to the specie standing without new legislation."

Views of Mr. Cernuschi on Resumption.—Monsieur Cernuschi, a well-known French writer on financial questions and a warm bimetallist, has been for some time in Washington, and was for four days under examination before the Silver Committee.

The following is his plan for enabling the Government to resume specie payments in gold and silver on the 1st January 1878:—

"The Secretary of the Treasury to be authorised and required, as rapidly as practicable, to open for three days in the principal markets of Europe a public subscription to a loan of 85,000,000 l. sterling (nominal), to be called United States Sterling Consols, with perpetual interest at the rate of 4 per cent. per annum, payable half-yearly, in London, in pounds sterling.

"The coupon first due shall be paid on the 1st day of October 1877.

"The price of issue shall be under par, at such rate as in the judgment of the Secretary of the Treasury will insure the success of the operation.

"The instalments on the loan shall be payable monthly, and shall extend over a period

* For the fiscal year ending 30th June 1876.

UNITED STATES.

a period of 12 months, with option of payment in advance under discount, at a rate to be fixed from time to time by the Secretary of the Treasury.

"Should the amount applied for be in excess of the whole amount of the stock, the subscriptions will be reduced *pro rata*."

"The expenses of the issue will be paid out of the funds produced by the loan."

"The United States Sterling Consols to be exempt from the payment of all taxes or duties of the United States."

"The specie payments resumption will take place in January 1878, and the greenbacks will continue to circulate, but as certificates of deposit reimbursable in coin, at call, in New York."

"On and after the 1st of January 1878, the mints of the United States will be open for the coinage of the old silver dollar, weighing $412\frac{1}{2}$ grains 9-10ths fine; and upon the adoption of this plan, the weight of the gold dollar will be immediately raised to 26.61 grains 9-10ths fine, and the gold pieces will be coined accordingly."

"The mint charge for converting gold and silver standard bullion into coin shall be equal for the two metals, at the rate of one-half cent. per dollar coined."

"Until the 1st of January 1878, the gold coins now current may be exchanged for new gold coins, dollar for dollar, at the office of the assistant treasurer of the United States, in the city of New York, after which time they will cease to be a legal tender."

"On and after the 1st of January 1878, all existing debts stipulated in dollars, of whatever denomination, shall, without exception, be payable in the new bimetallic currency; and gold and silver dollars shall be equally legal tender in full for all payments."

It will be seen that Monsieur Cernuschi's idea is that the Government must accumulate a sum in metal equal to the amount of "greenbacks" in circulation, for they have not only to redeem those "greenbacks," but they must at once supply their place with a metallic currency. In his opinion, converting "greenbacks" into interest bearing bonds, would deprive the country of a circulating medium, and thus produce a financial crisis.

In order to get this amount of metal, he recommends a loan of 85,000,000 *l.* (equal at par to about \$412,250,000 in gold), the interest on which shall be payable half yearly in London and in sterling.

The reasons for payment in sterling are given by him in the following Appendix to his suggestions.

EXPLANATORY NOTE.

"To resume specie payments, the Government of the United States must not only retire \$300,000,000 of greenbacks, but also supply their place by putting into circulation \$300,000,000 of metal. Should the greenbacks be converted directly into interest-bearing bonds, the country, being deprived of currency, would be exposed to a monetary crisis, and the Government, after having issued interest-bearing bonds in exchange for greenbacks, would possibly be under the necessity of issuing new greenbacks."

"Admitting that the excess of exported over imported merchandise shall result in an importation of gold, and admitting that the Nevada mines shall be very productive, the metal so imported or extracted is not the property of the Government, but of individuals; and the fact still remains that if the Government shall retire greenbacks, it will have to procure a metallic sum of \$300,000,000."

"For that purpose, bonds must be issued, but what bonds? If the Government issues bonds with principal and interest payable in gold and silver at its pleasure (as are all the United States bonds issued in Europe up to the present), and if at the same time the law of 1873 prohibiting the coinage of silver is abrogated, these bonds will undoubtedly be refused in Europe. Europe has taken them until now, because, although stipulated payable in gold or silver dollars, there were no silver dollars existing, and no silver dollars could be coined. But if you begin to recoin silver dollars, all is changed; silver dollars are then at your disposal, and as the coinage of silver is now prohibited throughout Europe, and silver is there no more than a merchandise without monetary power,

power, your bonds would be unsaleable. Austria, which has always issued silver bonds, was recently obliged to issue gold bonds.

"If, on the other hand, in beginning to recoin silver dollars, you should issue bonds with principal and interest payable exclusively in gold dollars, you would recognise the gold dollar as having a superiority over the silver dollar. In place of the bimetallic standard you would then have two conflicting standards, gold as international money, and silver as merely national money; all your gold would be rapidly exported, and you would remain with only silver. As compared with such a result, it would be better to maintain the present national currency, the greenbacks, and thereby save to the Government the burden of issuing new bonds.

"The only safe means to overcome all difficulties is to issue an external loan in sterling. By this you not only avoid making a distinction between the gold dollar and the silver dollar, but you do not engage to pay the coupons expressly in gold. You will pay in pounds sterling.

"The pound sterling was for a long time of gold and silver, then of paper. It is of gold to-day, but before long may be again of gold and silver. Therefore it is evident that for the American people a debt in sterling is less stringent than a debt in gold dollars.

"Once in possession of \$300,000,000 of gold, produced by the sterling loan, the United States will be strong enough to establish bimetallicism. Then France recoins silver willingly, and the general rehabilitation of this metal follows as a natural consequence. Silver being rehabilitated in America, and in Europe, the silver dollar having the same paying power as the gold dollar, you injure nobody in declaring that all debts stipulated in dollars of every denomination will be paid in the new bimetallic money, dollar for dollar.

"All this is possible with a loan in sterling. All this is impossible with a loan in coin dollars.

"Being drained of a considerable sum of gold, England cannot fail to see to what dangers she is exposed by her gold mono-metallism, and, perhaps, she will consent to confer with the powers for assuring by international law a perpetual peace between gold and silver.

"The subscriber will have to deposit only the small sum which will be sufficient to guarantee the payment of all the instalments.

"Issued under par, the United States sterling consols will easily command a premium on the market so soon as the subscription is announced, and the whole stock will be eagerly sought after as well for permanent investment as for speculation.

"All loans issued in France within the last 30 years have been issued by public subscription and under par. Through this method France obtained the money required for the wars in the Crimea and Italy. Through this method France was empowered to pay so rapidly the German indemnity.

"Once the subscription covered (and it can be covered within 24 hours) more than \$300,000,000 gold are assured to the United States, and the era of paper money is closed.

"The reason why the issue of a perpetual debt is preferable to that of a debt reimbursable at a fixed date is that, when the amount is very large, the engagement to reimburse at a fixed day is too onerous.

"And it is for this main reason that the English consols and French rentes are constituted as perpetual funds.

"Let the United States finances be prosperous. The excess of the revenue will then be first employed to extinguish the dollar bonds; and when the perpetual debt shall be the only debt in existence, it will be easy to reduce it, in buying bonds on the market, or by reimbursing them in series.

"Raise the weight of the gold dollar to 26.61 grains, in order to establish between the weight of the gold dollar and the weight of the silver dollar, the ratio $15\frac{1}{2}$, a ratio without which bimetallicism cannot be realised. If you revive the ratio 16, France cannot recommence to coin the 5-franc piece, which weighs $15\frac{1}{2}$ times the five gold franc piece.

"In 1834, the weight of the gold dollar was reduced 6 per cent. In now bringing it to 26.61 grains, its weight is augmented 3 per cent., and the error committed in 1834 is duly repaired.

UNITED STATES.

"The loan, the resumption, the coinage of silver as legal tender in full, are three operations whose success depends upon their being realised simultaneously and rapidly.

"*Henri Cernuschi.*"

"The Arlington, Washington,
"February 1877."

It will not escape notice that Monsieur Cernuschi expects, by drawing a vast sum of gold to this country, to force European nations to re-adopt the bimetallic standard, and thus bring silver into use again all over the world.

M. Cernuschi's proposals will not improbably attract more attention in Europe, and especially in London, than they have hitherto done here. They have been published at a moment when the public mind in America is absorbed by other and more exciting business, and they have so far met with little or no approval.

Production of Silver in the United States.—In connexion with this subject, I beg to add that, since the date of my last report, in the month of December, some further information has been received concerning the production of silver in the United States.

The most important is a return, hereto annexed, which has been received through Her Majesty's consul at San Francisco, from Messrs. Wells, Fargo & Co., the great bullion brokers and carriers of that city.

It estimates the production of gold and silver in the States and territories west of the Missouri river to have been as follows:—

YEARS.					SILVER.	GOLD.
					<i>Dols.</i>	<i>Dols.</i>
1871	-	-	-	-	20,286,000	35,898,000
1872	-	-	-	-	20,527,500	39,459,459
1873	-	-	-	-	28,352,100	40,456,593
1874	-	-	-	-	30,498,000	40,103,045
1875	-	-	-	-	34,043,910	41,745,147
1876	-	-	-	-	41,506,672	44,328,501

In some of Messrs. Wells, Fargo & Co.'s returns, the coin and bullion received from British Columbia, and from Mexico, are included, and it is not very clear whether the return from which the above is condensed includes them also. It would rather appear from the context that they are not so included, and that the return is meant to apply to the United States only. British Columbia has not furnished any silver; but Mexico is credited with over \$1,600,000 of silver bullion, in addition to \$500,000 of ore and base bullion. British Columbia appears to have furnished nearly \$1,500,000 of gold bullion and dust.

It will be recollected that Dr. Linderman, in his report to the Secretary of the Treasury of the 20th of October last, estimated the domestic production of silver in the United States, for the fiscal year ended 30th June 1876, at \$38,500,000.

Production not expected to Increase.—The returns of Messrs. Wells, Fargo & Co. are for the calendar year ending 31 December 1876, and would show an increase of over \$3,000,000, as compared with the fiscal year ending six months before. They certainly show a large yearly increase since 1873. It might, therefore, be concluded that the silver production of the American mines was becoming steadily larger; but such is not the expectation, either in California or here. On the contrary, a falling off is anticipated, unless new veins be discovered, and it is, I believe, considered very improbable that the production for this year will reach \$40,000,000.

To borrow the words of Messrs. Wells, Fargo & Co.'s circular:

"The total yield west of the Missouri river for 1877 may equal that of 1876, but it does not now appear probable"; and they also say, "reasoning from what is known of our country's product, as compared with estimates frequently put forth,

forth, we are inclined to believe there is almost universal exaggeration as to the amount of gold and silver produced throughout the world.

UNITED STATES.

"F. R. Plunkett."

ANNEXURE to Mr. *Plunkett's* Memorandum of 27 February 1877.

Wells, Fargo & Company,
Exchange, Banking and Express, San Francisco,
30 December 1876.

THE following is a copy of our annual statement of precious metals produced in the states and territories west of the Missouri River, including British Columbia and the west coast of Mexico during 1876, which shows an aggregate yield of \$90,875,173, being an excess of \$9,986,136 over 1875, the greatest previous annual yield in the history of the country. Arizona, California, Colorado, and Nevada, increase; British Columbia, Mexico, Montana, Oregon, Utah, and Washington, decrease. It is possible the falling off in Montana is more apparent than real, as we have not credited so much base bullion and ores by \$250,000 as were claimed for it. The notable increase is in Nevada, which produces more gold than any other state or territory; and of gold and silver combined, 5-ninths of the whole product of the United States. A large gold yield is often claimed for Arizona and New Mexico, but as \$2,710,000, or an average of less than \$100,000 per year, is the total amount deposited in United States mints since 1848 as from those territories combined, we think such claims cannot be substantiated. The total yield west of the Missouri River for 1877 may equal that of 1876, but it does not now appear probable.

The lead product of Utah, Nevada, and California about equals that of Missouri, Illinois, and Iowa.

STATEMENT of the Amount of Precious Metals produced in the States and Territories west of the Missouri River, during the Year 1876:

States and Territories.	Gold Dust and Bullion by Express.	Gold Dust and Bullion by other Conveyances.	Silver Bullion by Express.	Ores and Base Bullion by Freight.	TOTAL.
	Dols.	Dols.	Dols.	Dols.	Dols.
California - - -	14,635,963	1,463,596	796,308	1,719,940	18,615,807
Nevada - - -	220,803	22,080	44,725,802	4,312,079	49,280,764
Oregon - - -	919,257	229,814	-	-	1,149,071
Washington - - -	56,702	5,670	-	-	62,372
Idaho - - -	1,182,222	236,444	220,695	35,000	1,674,361
Montana - - -	1,956,553	195,655	274,824	350,000	2,777,032
Utah - - -	47,795	4,779	781,263	4,373,682	5,207,519
Colorado - - -	2,829,877	-	2,796,661	1,364,109	6,990,647
New Mexico - - -	76,892	-	255,281	18,621	350,294
Arizona - - -	103,528	-	336,564	671,900	1,111,992
Mexico - - -	51,880	-	1,620,656	541,212	2,213,748
British Columbia - -	1,310,515	131,051	-	-	1,441,566
TOTAL - - - \$	23,391,437	2,289,089	51,808,054	13,386,543	90,875,173

The method and form of the foregoing is exactly similar to that of statements, which we have compiled since 1870, wherein no attempt was made to show the amount of gold contained in silver or doré bullion, or the lead and copper in base bullion, but the violent fluctuations of silver as compared to gold, during the present year, renders an analysis desirable, and we have spared no pains to arrive at a correct conclusion, and the results are as follows:—In round figures, of \$37,000,000 produced from the Comstock Lode this year, \$17,125,000 or quite 46 per cent. was gold; of the whole product of Nevada, 38 per cent. was gold, and of the total silver product, so-called, \$18,647,925, or 31 per cent., was gold. The gross yield is constituted as follows: gold, \$44,328,501; silver, \$41,506,672; lead and copper, \$5,040,000, equal \$90,875,173.

Following the method indicated and the percentages arrived at for 1871 to

UNITED STATES. 1876 inclusive, for which years we have our own compilations to depend upon, the products separated are as follows :—

YEAR.	Total Product.	Lead, &c.	Silver.	Gold.
	Dols.	Dols.	Dols.	Dols.
1871 - - -	58,284,000	2,100,000	20,286,000	35,898,000
1872 - - -	62,236,959	2,250,000	20,527,500	39,459,459
1873 - - -	72,258,693	3,450,000	28,352,100	40,456,593
1874 - - -	74,401,045	3,800,000	30,498,000	40,103,045
1875 - - -	80,889,057	5,100,000	34,043,910	41,745,147
1876 - - -	90,875,173	5,040,000	41,506,672	44,328,501

We hoped to segregate the gold, silver, &c., for the years from 1870 to 1861 inclusive, also, but no data is obtainable that will stand the test of so careful an analysis as the years of 1871 to 1876 inclusive have been subjected to, and we see no way of reconciling discrepancy between \$ 66,000,000 gold and silver published as the estimate of United States officials for 1870, and \$ 56,184,000 shown here for 1871, which was a more productive year by at least \$ 4,000,000 than 1870. We are confident that similar discrepancies or exaggerations as to the product of the United States exist in the estimates usually accepted for the years from 1870 to 1861 inclusive, and possibly all the way back to 1848.

Reasoning from what is known of our own country's product, as compared with estimates frequently put forth, we are inclined to believe that there is almost universal exaggeration as to the amount of gold and silver produced throughout the world.

As of possible interest, we give herewith the usually accepted estimates of the world's product of gold and silver in dollars, lowest and highest price for silver in London, in pence, per standard ounce, and the amount exported, in dollars, from Southampton to India, China, &c., from 1849 to 1876 inclusive.

ESTIMATE of the World's product of Silver, Lowest and Highest Price in London, in Pence, per Standard Ounce, and Exports from Southampton to India, China, &c., from 1849 to 1876 inclusive.

YEAR.	United States.	Mexico and South America.	Russia.	Other Countries.	Total Silver Product.	Lowest.	Highest.	Amount Exported from Southampton to India, China, &c.
	Dols.	Dols.	Dols.	Dols.	Dols.	d.	d.	Dols.
1849 - - -	-	30,000,000	500,000	10,000,000	40,500,000	59½	60½	-
1850 - - -	-	30,000,000	500,000	10,000,000	40,500,000	59½	61½	8,575,000
1851 - - -	-	30,000,000	500,000	10,000,000	40,500,000	60	61½	12,235,000
1852 - - -	200,000	30,000,000	500,000	10,000,000	40,700,000	59½	61½	15,585,000
1853 - - -	200,000	30,000,000	500,000	10,000,000	40,700,000	60	62½	15,475,000
1854 - - -	200,000	30,000,000	500,000	10,000,000	40,700,000	60	61½	32,155,000
1855 - - -	200,000	30,000,000	500,000	10,000,000	40,700,000	60	61½	60,565,000
1856 - - -	200,000	30,000,000	500,000	10,000,000	40,700,000	60½	62½	83,655,000
1857 - - -	200,000	30,000,000	500,000	10,000,000	40,700,000	61	62½	23,765,000
1858 - - -	200,000	30,000,000	500,000	10,000,000	40,700,000	60½	61½	74,140,000
1859 - - -	200,000	30,000,000	500,000	10,000,000	40,700,000	61½	62½	42,390,000
1860 - - -	1,000,000	30,000,000	500,000	10,000,000	41,500,000	61½	62½	34,120,000
1861 - - -	1,500,000	30,000,000	500,000	10,000,000	42,000,000	60½	61	50,455,000
1862 - - -	3,000,000	30,000,000	500,000	10,000,000	43,500,000	61	62½	41,315,000
1863 - - -	7,000,000	30,000,000	500,000	10,000,000	47,500,000	61	61½	31,270,000
1864 - - -	10,000,000	30,000,000	500,000	10,000,000	50,500,000	60½	62½	17,990,000
1865 - - -	11,000,000	30,000,000	500,000	10,000,000	51,500,000	60½	61½	11,325,000
1866 - - -	10,000,000	30,000,000	500,000	10,000,000	50,500,000	60½	62½	3,210,000
1867 - - -	13,000,000	30,000,000	500,000	10,000,000	53,500,000	60½	61½	8,175,000
1868 - - -	12,000,000	27,500,000	500,000	10,000,000	50,000,000	60½	61½	11,810,000
1869 - - -	12,000,000	25,000,000	500,000	10,000,000	47,500,000	60	61	7,895,000
1870 - - -	16,000,000	25,000,000	500,000	10,000,000	51,500,000	60½	62	18,560,000
1871 - - -	20,286,000	27,500,000	500,000	10,000,000	58,286,000	60½	61	28,270,000
1872 - - -	20,527,500	26,000,000	500,000	10,000,000	57,027,500	59½	61½	12,485,000
1873 - - -	28,352,100	24,000,000	500,000	10,000,000	62,852,100	57½	59½	35,460,000
1874 - - -	30,498,000	25,000,000	500,000	10,000,000	65,998,000	57½	59½	18,570,000
1875 - - -	34,043,910	25,000,000	500,000	10,000,000	69,543,910	55½	57½	47,500,000
1876 - - -	41,506,672	25,000,000	500,000	10,000,000	77,006,672	46½	58½	-
TOTAL - - -	273,314,182	800,000,000	14,000,000	280,000,000	1,367,314,182	-	-	747,450,000

ESTIMATE of the World's product of Gold from 1849 to 1876 inclusive, and of Gold and Silver combined.

YEAR.	United States.	Australia.	Mexico and South America.	Russia.	Other Countries.	Total Gold Product.	Total Gold and Silver Product.
	Dols.	Dols.	Dols.	Dols.	Dols.	Dols.	Dols.
1849	40,000,000	-	5,000,000	14,000,000	2,500,000	61,500,000	102,000,000
1850	50,000,000	-	5,000,000	13,000,000	2,500,000	70,500,000	111,000,000
1851	55,000,000	7,000,000	5,000,000	12,000,000	2,500,000	81,500,000	122,000,000
1852	60,000,000	80,000,000	5,000,000	12,000,000	2,500,000	159,500,000	200,200,000
1853	65,000,000	70,500,000	5,000,000	12,000,000	2,500,000	155,000,000	195,700,000
1854	60,000,000	47,500,000	5,000,000	12,000,000	2,500,000	127,000,000	167,700,000
1855	55,000,000	60,500,000	5,000,000	12,000,000	2,500,000	135,000,000	175,700,000
1856	55,000,000	71,500,000	5,000,000	13,500,000	2,500,000	147,500,000	188,200,000
1857	55,000,000	57,000,000	5,000,000	13,500,000	2,500,000	133,000,000	173,700,000
1858	50,000,000	53,500,000	5,000,000	13,500,000	2,500,000	124,500,000	165,200,000
1859	50,000,000	54,000,000	4,500,000	13,500,000	2,500,000	124,500,000	165,200,000
1860	46,000,000	52,500,000	4,500,000	13,500,000	2,500,000	119,000,000	160,500,000
1861	43,000,000	49,000,000	4,500,000	15,000,000	2,500,000	114,000,000	156,000,000
1862	39,000,000	46,500,000	4,500,000	15,000,000	2,500,000	107,500,000	151,000,000
1863	40,000,000	44,500,000	4,500,000	15,500,000	2,500,000	107,000,000	154,500,000
1864	46,000,000	45,500,000	4,000,000	15,000,000	2,500,000	113,000,000	163,500,000
1865	53,000,000	44,000,000	4,000,000	16,500,000	2,500,000	120,000,000	171,500,000
1866	53,500,000	44,000,000	4,000,000	17,000,000	2,500,000	121,000,000	171,500,000
1867	51,500,000	41,500,000	3,500,000	17,000,000	2,500,000	116,000,000	169,500,000
1868	48,000,000	48,500,000	3,000,000	18,000,000	2,500,000	120,000,000	170,000,000
1869	49,500,000	46,500,000	2,500,000	20,000,000	2,500,000	121,000,000	168,500,000
1870	50,000,000	38,500,000	2,500,000	22,500,000	2,500,000	116,000,000	167,500,000
1871	35,898,000	43,000,000	3,500,000	24,000,000	2,500,000	108,898,000	167,184,000
1872	39,459,459	36,500,000	3,500,000	23,000,000	2,500,000	104,959,459	161,986,959
1873	40,456,593	39,000,000	3,500,000	22,500,000	2,500,000	107,956,593	170,808,693
1874	40,103,045	29,500,000	4,000,000	22,500,000	2,500,000	98,603,045	164,601,045
1875	41,745,147	28,500,000	4,000,000	22,500,000	2,500,000	99,245,147	168,789,057
1876	44,328,501	28,000,000	4,000,000	22,500,000	2,500,000	101,328,501	178,335,173
TOTAL	1,356,490,745	1,207,000,000	118,500,000	463,000,000	70,000,000	3,214,990,745	4,582,304,927

Since the demonetisation of silver by Germany, \$ 40,000,000 is supposed to have been the amount sold by that Government, with a remaining surplus of possibly \$ 80,000,000, upon the basis of 10 marks of token money, silver, as the average required per capita for 42,000,000 of people; but \$ 50,000,000 of the \$ 80,000,000 remaining may be required to meet the increase suggested in the Reichstag, of 5 marks, or from 10 to 15 marks per capita.

If the legal tender and National Bank \$1 notes should be retired, and silver substituted, \$ 100,000,000, including all subsidiary coins, would not be excessive for the use of the United States.

The export to India, China, &c., is larger this year than any, save one, since the Sepoy rebellion and India railroad building era (1855 to 1859 inclusive), Southampton showing \$ 47,500,000, and the United Kingdom combined say, \$ 70,000,000.

A comparison of the actual and probable demand with the actual and probable production does not appear to be a sufficient explanation for the extraordinary depreciation of silver during 1876.

Jno. J. Valentine,
General Superintendent.

CENTRAL
AMERICA.

CENTRAL AMERICA.

Sir *Henry Scholfield* to Mr. *Lister*.

(Extract.)

Guatemala, 21 October 1876.

No silver is produced in Guatemala nor in Central America to any appreciable extent. I do not think that, in all the five republics, 10,000 *l.* of silver ore is mined in 12 months.

The currency of Central America is silver. The silver dollar is exactly equal to the 5-franc piece, which is at par with the fractional silver currency of the United States of America, and with the currency of Peru, Chili, Bolivia, and the United States of Colombia. These dollars are worth 7 per cent. discount less than the Mexican dollars. In Costa Rica they have a debased silver coinage, worth about 20 per cent. less than the Mexican.

The depreciation of silver has made itself very sensibly felt in Central America, for although the standard nominally never changes, the fact of its having too high a value attached to it, when compared with gold, causes a corresponding rise in all articles which come from abroad, or which can be disposed of abroad, in countries where the standard is gold.

Thus exchange on England, Europe, and the United States has risen lately in an unprecedented manner, because silver here has to be converted into gold there, to be employed in the payment of imported goods and of previous indebtedness, and more silver is now required for these operations than before; and as the exports are paid for in gold, and there is an extra profit on the bills of exchange representing the value of the exports, the producers demand this extra price, and therefore more silver has to be paid for the same article, and consequently it has a smaller purchasing power.

Henry Scholfield.

VENEZUELA.

VENEZUELA.

(Commercial, No. 12.)

Mr. *Middleton* to the Earl of *Derby*.

My Lord,

Caracas, 16 November 1876.

IN connexion with your Lordship's circular, Commercial, of the 2nd of September, received by me on the 21st of October last, I have the honour to enclose a copy and translation of a section of the report for the present year of the Minister of Finance to the Congress, containing statements referring to the national money of Venezuela coined in Europe for account of the Government, and delivered in this country for circulation, with a view to remedying the embarrassments produced by the large amount of damaged money in circulation, and likewise those produced by coin not possessing the proper legal conditions having been called in.

By the table incorporated in the section of the report of the Minister of Finance referred to, it appears that, under the five several dates specified therein, the amount of 402,819.40 venezolanos nominal, and 400,000 venezolanos real value, in silver pieces of 5, 10, 20, and 50 cents., or $\frac{1}{2}$, 1, 2, and 5 reals, of the weight severally of 1.25, 2.50, 5, and 12.50 grams, and of the standard of 835 milésimos of silver respectively, and the amount of 385,579.98 venezolanos nominal, and 346,000 venezolanos real value, in gold pieces of 5 venezolanos, amounting to a total of all descriptions of money of 788,399.38 venezolanos nominal, and 746,000 venezolanos real value, have been delivered to the Venezuelan Government from Paris, where the coining was effected through their agent, the authorisation of the French Government having been previously obtained by application to their legation in Caracas.

The

The difference in the nominal and the real value of the above amounts is to be accounted for by the disbursements occasioned by the preparation of dies for the several pieces of coin specified and the labour expended in their manufacture, as also by a correction of the date on the shield which was ordered to be made. It may be observed also that no Venezuelan silver pieces of the value of 100 cents. (being one venezolano) have been to all appearance coined in Paris since, although the die for them was cut more than two years ago; no such pieces have been imported, in consequence, as it would seem, of smaller pieces being more necessary, in order to provide for the requirements of retail trades, payment of wages in the agricultural districts, &c., gold pieces being the usual medium employed in wholesale trading transactions, and the more important classes of payments, the Venezuelan pieces already imported being indeed totally insufficient for meeting the smaller requirements above referred to, and which can only, as yet, be provided for by the help of the larger number of small silver pieces of different foreign countries still in circulation, all further importation of any foreign silver coin, whatever may be its value, having been prohibited, and its further circulation to be also prohibited, so soon as a sufficient amount of national silver money shall have been imported to admit of it, by the resolution of the Minister of Finance, under date of the 28th of June, which I had the honour of enclosing to your Lordship by my Despatch of the 15th of July last.

As is also stated in the enclosed section of the report of the Minister of Finance, a balance of new Venezuelan coin from Paris of 647.91 venezolanos remained in the hands of the agent of Venezuela charged with the coining operations in Paris referred to.

By a resolution of the President of the Republic, also under date of the 28th of June last, the Venezuelan Government contracted with a foreign firm of this capital for the coining and importation of silver pieces of similar value to that possessed by those specified in the table enclosed, and also of a standard of 835 milésimos of silver, to the amount of 240,000 venezolanos, and with permission for the same dies as those before used to be made available.

Owing to the value of German thalers having been reduced from 8 to 7½ reals by Presidential decree, they are being sent back to Europe to so large an amount that there will soon be no more left in the country, and such is the case also in regard to gold pieces of 20 marks, the value of which was so reduced from 5.20 to 5 venezolanos.

As connected with currency operations in Venezuela, I may mention also that by a resolution of the President of the 14th of June last, a coining was ordered, to the amount of 150,000 venezolanos, in the United States of North America, for which permission was obtained through the legation of that country in Caracas, of pieces representing, in nickel money, the type of 2½ cents of a venezolano, thus divided:—

	Venezolanos.
2,000,000 pieces of 2½ cents - - - - -	50,000
10,000,000 pieces of 1 cent. - - - - -	100,000
	<hr/>
Venezolanos -	150,000

the said pieces to be of like diameter to those of the same value in circulation in the United States of North America, but to bear the arms of Venezuela and the value upon them.

I have the honour to add that there is scarcely any production of silver in Venezuela, nor does it appear probable that any particular perturbation, such as that which has been caused by the depreciation of silver elsewhere, will occur.

I have, &c.

(signed) R. T. C. Middleton.

BRAZIL.

B R A Z I L .

Enclosure of Mr. *Buckley-Mathew's* No. 13, Commercial, dated 8 November 1876.

MEMORANDUM on the Monetary System of Brazil.

THE monetary system of Brazil consists of an *inconvertible forced paper currency*, supplemented by a gold, silver, nickel, and copper coinage.

The real is the monetary unit. The milreis may, however, be taken as the practical monetary unit. The sovereign being a legal tender for 8,890 reis, the sterling value of the milreis should be 27 *d.*, which is the par of exchange. But, in consequence of the forced paper currency, and the demand for sterling remittances exceeding at times the value of the produce to be exported, the sterling value of the milreis is constantly fluctuating. During the last 20 years it has ranged from 14 *d.* to 30 *d.*

The total amount of inconvertible paper currency in circulation in March 1875 is estimated in the last Report of the Minister of Finance at 181,868,699 milreis, which, calculated at the present exchange of 24 *d.* to the milreis, amounts to, in sterling, 18,186,869 *l.*, and is thus made up:—

State Paper Money	-	-	-	-	Milreis.	149,501,299
Bank of Brazil	-	-	-	-	Milreis.	
Bank of Bahia	-	-	-	-	30,780,000	
Bank of Maranhao	-	-	-	-	1,356,375	
					231,025	
						32,367,400
						181,868,699

Besides this paper currency a limited amount of national gold and silver coins are in circulation. It has, however, been found impossible to estimate, with any satisfactory degree of exactness, the amount in existence at the present time. During the Paraguayan war a large amount of silver was monetised, but the greater portion soon left the country, and what now remains must be very small.

Silver milreis and silver $\frac{1}{2}$ -milreis pieces are seldom met with, and are rather objected to on account of their apparent similarity to the nickel coinage of 100- and 200-reis pieces.

It has been suggested that silver should be substituted for the small paper notes of 1 milreis and 500 reis; and if its value continues to decrease, it is possible that some such measure may be adopted, in which case Brazil would absorb an amount of silver proportionate to its general currency. This, however, depends on exchange going up to 27 $\frac{1}{2}$ *d.* or 28 *d.* the milreis, which would cause a large amount of sovereigns to be imported into and circulated in the country.

The amount of currency per head in Brazil is considerably below that of European countries, estimating the population at 11,000,000, and the currency at about 19,000,000 *l.* sterling.

In addition to the paper, gold, and silver, there is a limited amount of base coinage of nickel and copper, amounting to about 500,000 *l.* sterling. In fact, it may be said that this base coinage, and the paper money to which it is subsidiary, constitutes, for all practical purposes, the currency of the country, for gold is looked upon purely as a merchandise, and silver is seldom seen in circulation.

Schedule No. 1 shows the total amount of gold and silver coined by the Imperial Mint during the last 20 years; and Schedule No. 2 gives the amount which, during the last 5 years, has passed through the Customs.

But unless, as above indicated, some alteration of the currency system of Brazil takes place, there is no reason to suppose that the Customs Schedule

of the last five years will prove an unfaithful basis on which to calculate, for a like period, the amount of Brazilian dealings in foreign coins and the precious stones.

BRAZIL.

N. R. O'Conor.

Rio Janeiro,
2 November 1876.

SCHEDULE No. 1.

VALUE of GOLD and SILVER Coined at the Mint of *Rio de Janeiro*, 1855-56 to 1874-75.

Financial Years.	Gold.	Silver.	Total Coinage.
	<i>Milreis.</i>	<i>Milreis.</i>	<i>Milreis.</i>
1855-56 - - - - -	6,919,700	1,071,071	7,990,771
1856-57 - - - - -	5,519,346	668,227	6,187,573
1857-58 - - - - -	4,316,934	1,095,687	5,412,621
1858-59 - - - - -	1,029,576	1,465,956	2,495,532
1859-60 - - - - -	436,275	1,276,935	1,713,210
1860-61 - - - - -	418,950	1,739,402	2,158,352
1861-62 - - - - -	540,230	692,117	1,232,347
1862-63 - - - - -	250,240	836,548	1,086,788
1863-64 - - - - -	80,440	949,440	1,029,880
1864-65 - - - - -	221,190	1,352,541	1,573,731
1865-66 - - - - -	1,465,980	1,196,848	2,662,828
1866-67 - - - - -	2,505,217	1,074,070	3,579,287
1867-68 - - - - -	241,910	580,011	821,921
1868-69 - - - - -	112,940	724,705	837,645
1869-70 - - - - -	113,740	5,224	118,964
1870-71 - - - - -	39,238	- - -	39,238
1871-72 - - - - -	79,293	- - -	79,293
1872-73 - - - - -	62,087	- - -	62,087
1873-74 - - - - -	85,866	- - -	85,866
1874-75 - - - - -	106,760	117,057	223,817
1855-56 to 1874-75 - - - -	24,545,912	14,845,839	39,391,751
*Equal in sterling to - - - £.	2,761,445	1,670,157	4,431,572
Yearly average Coinage- - £.	138,071	83,508	221,579

* The sterling value of the milreis has been taken at 27 d.

SCHEDULE No. 2.

VALUE of GOLD and SILVER Imported into *Rio de Janeiro*, 1871-72 to 1875-76
(as given in a Customs Return, dated 23rd October 1876).

Whence Imported.	Financial Years.					TOTAL, 1871-72 to 1875-76.
	1871-72.	1872-73.	1873-74.	1874-75.	1875-76.	
GOLD.						
In Coin (the £. having been calculated at 8,890, and the dollars at 1,800 reis):	£.	£.	£.	£.	£.	£.
Great Britain - - - - -	552,994	605,304	291,481	132,653	530,259	3,691,059
Germany - - - - -		-	180	-	84	
France - - - - -		15,437	-	223	942	
Italy - - - - -		5,573	-	77	-	
Portugal - - - - -		1,740	200	2,734	12,424	
United States - - - - -		34,593	-	-	21,300	
Chili - - - - -		113	4,050	-	-	
Argentine Confederation - - -		43,817	171,992	178,217	421,631	
Uruguay - - - - -		226,059	154,865	141,573	140,544	
TOTAL - - -	552,994	932,636	622,768	455,477	1,127,184	3,691,059
In Bars (calculated at 1,010 reis per gramme):						
Great Britain - - - - -	-	-	-	-	1,808	1,808
Belgium - - - - -	311	-	-	-	-	311
TOTAL - - -	311	-	-	-	1,808	2,119
Wrought (calculated at 1,500 reis per gramme):						
Great Britain - - - - -	21,162	31,292	37,812	26,923	26,172	142,861
Germany - - - - -	1,528	2,619	613	895	1,710	7,365
France - - - - -	9,322	32,835	23,459	77,643	55,418	198,677
Italy - - - - -	219	-	20	523	204	966
Belgium - - - - -	1,835	2,737	7,189	502	557	12,820
Portugal - - - - -	306	707	377	1,478	342	3,212
United States - - - - -	43	370	23	-	126	562
Argentine Confederation - - -	225	-	-	585	1,179	1,989
Uruguay - - - - -	1,787	135	-	-	722	2,644
Various Countries - - - - -	-	-	-	-	530	530
TOTAL - - -	36,429	70,695	68,993	108,549	86,960	371,626
SILVER.						
In Coin (free of duty):						
United States - - - - -	13,710	1,453	-	-	-	24,328
Chili - - - - -		1,125	-	-	293	
Argentine Confederation - - -		390	495	-	-	
Uruguay - - - - -		3,034	225	3,603	-	
TOTAL - - -	13,710	6,002	720	3,603	293	24,328
Wrought (calculated at 150 reis per gramme, paying 7 per cent. duty):						
Great Britain - - - - -	2,344	4,833	6,801	2,181	4,030	20,189
Germany - - - - -	12	2,379	372	258	322	3,343
France - - - - -	1,560	7,887	6,324	11,709	6,252	33,732
Italy - - - - -	-	204	63	277	-	544
Belgium - - - - -	797	2,351	256	269	18	3,691
Portugal - - - - -	3,366	3,476	4,193	1,903	2,456	15,396
United States - - - - -	69	5	-	-	79	153
Argentine Confederation - - -	45	-	-	-	17	62
TOTAL - - -	8,193	21,135	18,011	16,597	13,174	77,110
GRAND TOTAL, Gold and Silver - £.	611,637	1,030,466	710,492	584,226	1,220,419	4,166,242

Note.—The original figures were in milreis, which have been converted to sterling at 27 d.

VALUE of GOLD (in Dust, Bars, and Lumps) Exported from *Rio de Janeiro*, 1869-70 to 1875-76 (as given in a Customs Return, dated 20th October 1876).

Destination.	Financial Years.							TOTAL, 1869-70 to 1875-76.
	1869-70.	1870-71.	1871-72.	1872-73.	1873-74.	1874-75.	1875-76.	
	£.	£.	£.	£.	£.	£.	£.	£.
Great Britain - -	128,114	33,980	8,408	40,568	83,073	171,780	288,136	754,059
France - - - -	273	7,432	7,876	- - -	171	- - -	- - -	15,752
Portugal - - -	- - -	- - -	- - -	138	315	- - -	- - -	453
TOTAL - - - £.	128,387	41,412	16,284	40,706	83,559	171,780	288,136	770,264

Note.—The sterling value of the milreis has been taken at 27 *d.* The mean value of the gold exported was 1,050 reis per gramme, subject to 2 per cent. duty.

(Commercial, No 1.)

Mr. *Walker* to the Earl of *Derby*.

(Extract.)

British Consulate, Pernambuco,
18 October 1876.

OWING to the absence of all silver currency in this province (the whole of the money being either paper, copper, or nickel, the former of which is predominant), I shall be unable to furnish any information that would be of service on this point.

(signed) *E. H. Walker*.

(Commercial, No. 2 of 1876.)

Mr. *Austin* to the Earl of *Derby*.

(Extract.)

Rio de Janeiro, 23 December 1876.

BRAZIL has not exercised any influence externally in the depreciation of this metal, at least for several years. There are no silver mines in operation, and consequently no production, and there is neither importation nor exportation of the article.

A small quantity of silver currency existed in the Empire in 1865, when the war with Paraguay broke out. In the third year of that war, however, in consequence of the extraordinary depreciation in the paper currency, it was all exported as bullion to the River Plate. The latter depreciation amounted in 1868 (the third year of the war) to 40 per centum, when silver coin, though containing a large amount of alloy, was consequently at a premium for exportation.

This silver has never found its way back into the country, and its place in the circulation is now represented by small notes of the nominal value of 1*s.* and 2*s.* respectively.

(signed) *R. Austin*.

PERU.

P E R U.

(Commercial, No. 10.)

Mr. *Graham* to the Earl of *Derby*.

(Extract.)

Lima, 27 November 1876.

IN the total absence of statistics, it is not easy to furnish satisfactory reports upon this or any other subject in Peru. A statistical bureau was established in 1874, but up to the present has given no results, and I have, therefore, been under the necessity of consulting such authors and records as I could obtain access to; and if the result is somewhat meagre, I trust your Lordship will kindly take into consideration the difficulties with which I have had to contend.

The laws regulating the working of mines in this country are still the old Spanish mining laws, promulgated by Royal Decree of 29th December 1777, 20th January and 20th August 1779, with additions and modifications made under the reign of Ferdinand VII. A Royal Order in relation to mining laws in Peru was issued on 8th December 1785, and was published in Lima 7th October 1786. Copies of these laws can be more easily obtained in Madrid than in Lima. The present Congress is occupied in modifying the old code, and a project of law is now before the House. There are now no less than 15,000 mines held in Peru, of which only about 600 are worked; but this state of things will be amended by the new laws. Silver is the standard here; gold was demonetised by the law of 30th December 1872.

The circulation of the four associated banks on the 15th of this month amounted to 13,098,820 soles 35c., of which they had in specie 1,882,018 soles 99c.; 62,000 soles being in gold, and 1,820,018 soles in silver. The notes of these banks are a legal tender for all payments, taxes, import duties, &c. The export of silver coin is prohibited; gold coin pays 3 per cent. export duty; silver, in bars, 3 per cent.; silver coin is melted down into bars in order to avoid this prohibitory law, and is sent abroad in considerable quantities; but for obvious reasons it is impossible to obtain any reliable data. Silver ore is produced and exported in very large quantities, but no data can be produced. Silver soles are now at 56 per cent. premium, and are only held by a few dealers. No brassage is paid, the Government coin bars free of expense, and return their full value in specie, giving the alloy gratis. There is no legal limit to the amount of gold and silver allowed to be coined. Only one mint exists in Peru, and is managed by the Government in Lima; between the years 1868 and 1875 this establishment coined 17,053,389 silver soles. Foreign coins are allowed to be imported and circulate by custom; they come principally from Bolivia and Chile. Mining is free, as will be seen by reference to the laws above quoted.

Peru is the great silver-producing country of South America; it is to be found in all parts of the western range of the Andes, between latitudes 3° and 22° south. The most important district, that of Cerro de Pasco, produced, since the discovery of the ore in the year 1630 to 1849, no less than \$475,000,000. A proposal has been made to run a tunnel for 150 metres under the present workings, on the plan of the famous Sutro tunnel at the Virginia city mines, Nevada, for the purpose of tapping the mines, now full of water; and it is supposed that sulphurets of silver or bronzes to the value of \$500,000,000 would be obtained, taking as a basis the quantity and amount worked out from above the present line of operations.

According to Castelnau's "*Histoire d'un Voyage dans l'Amérique du Sud de Rio Janeiro à Lima, années de 1843 à 1847*," undertaken by order of the French Government, and published in Paris, there were smelted in 30 years, viz., from 1790 to 1820, 101,784,476 ounces of silver in the seven assaying works of the then Spanish Government at Lima, Truxillo, Pasco, Huacuanga, Arequipa, Tacna, and Puno. According to the same author, in the 5 years which transpired between 1835 and 1839, there were smelted in the same places silver to the amount of \$14,506,721 56 cents., and in the 12 years from

1783 to 1794 exports of all kinds from Callao were valued at \$88,120,785, of which \$78,995,756 were silver. These large amounts were produced by the old system of mining and smelting, the ores being brought from long distances on mules over the mountains by narrow paths, in many instances cut in the sides of precipices, where often animals and loads were lost, owing to a false step or stumble. I have myself seen these old paths, and it appears incredible how they could have been used for such a purpose.

Railroads are now opening up the great ore-beds; and when, owing to the improved machinery which can now be sent up, mines are fairly started, Peru will, in a few years, produce immense quantities of silver, derived from a much larger area than is known in any other country at the present day.

No reliable data can be obtained here relative to the export of silver to Great Britain, and better information on that subject will be found in the Board of Trade reports on imports into the United Kingdom.

(signed) *W. E. Graham.*

PERU.

CHILE.

CHILE.

Mr. Drummond Hay to the Earl of Derby.

(Extract.)

(Commercial, No. 16.)

British Consulate General,
Valparaiso, 28 November 1876.

I HAVE the honour to furnish such information as I have been able to collect in reference to the production and distribution of silver from the mines of Bolivia and Chile, the export of that metal, and the legislation in this country touching the current coins.

In obtaining the information I now give, I have been much indebted to Mr. Stewart Jackson, of Valparaiso, an English gentleman whose opinion in reference to such matters carries great weight, owing to his long residence on this coast, and constant association with mining companies and banks, in which he holds leading positions.

The mines of Caracoles, Bolivia, began to produce regularly in 1871, and the present production from those mines may be said to average about 600,000 marks per annum. The weight of a mark is 8 ounces, and may be estimated at a value of \$10 gross.

The following Table shows the produce yielded by 16 of the richest mines in Caracoles during a period of 5 years :—

SILVER ORES produced by the *Descubridoras* Mines, from the 1st November 1871 to the 30th September 1876.

DATE.	Ores distributed.			Ores sold.		
	Spanish Quintals.*	Marks.*	Average Ley.	Spanish Quintals.	Marks.	Average Ley.
1871. Nov. and Dec. - -	22,114.35	109,212.91	316.06	—	—	—
1872. 1st Semester - -	46,983.69	143,912.65	196.03	16,388.43	41,750.10	163.05
" 2nd " - -	99,657.92	260,468.50	167.27	3,687.74	4,357.88	75.62
1873. 1st Semester - -	119,710.96	300,512.95	160.66	4,323.80	4,966.55	73.47
" 2nd " - -	128,775.32	333,886.34	195.93	4,254.06	3,877.73	50.82
1874. 1st Semester - -	126,593.56	254,580.76	128.70	5,743.82	5,302.06	59.08
" 2nd " - -	125,053.84	229,651.91	117.53	22,621.91	14,649.68	41.44
1875. 1st Semester - -	79,255.34	148,527.49	119.93	48,230.08	34,820.15	46.20
" 2nd " - -	69,147.69	131,077.49	121.30	123,235.46	90,968.36	47.24
1876. 1st Semester - -	105,381.73	90,695.34	55.08	20,857.47	15,118.46	46.39
" 3rd Quarter - -	41,006.95	28,732.93	44.84	1,536.82	8,352.13	34.78
	963,681.29	2,031,260.27	134.89	250,879.59	223,662.60	57.05

* 200 marks=1 quintal.

CHILE

Total Production.

	Quintals.	Marks.	Average Ley.
Ores distributed - - - -	963,681.29	2,031,200.27	134.89
Ores sold - - - -	250,879.59	223,662.60	57.05
Total Production - - -	1,214,560.88	2,254,922.87	118.82

The production of the Descubridoras mines of Caracoles is shown by the above table to have been \$22,000,000 dols. worth of silver in 5 years, or, on an average, about \$4,500,000 per annum. The remaining mines of Caracoles may be said to have produced a quantity equal to a little over one-fifth of this amount.

It is very difficult to ascertain the actual cost of production, as it varies according to the different mines. The cost of the silver produced in the Deseada mine during the month of October last was \$1 per mark, but this was owing to great economy in general expenses, and also that part of the production was from rubble of the old working. The Descubridoras mines, with 4 mines in active work and 6 in half-work, produced 222,708 marks; and the cost of production, administration, freight to Antofagasta, and other expenses, was \$438,000, or a little less than \$2 per mark; but this cannot be taken as the general cost, as many other mines were worked unproductively at the same time. The average cost of production may therefore be fairly estimated at \$3½ per mark. This, however, does not include the cost of turning the ore into bar-silver, which varies according to the "ley," or fineness of the stuff.

The mines in Bolivia exist in Oruro, Potosi, Tupiza, Huanchaca, and Caracoles; the first four mineral districts yield from 40,000 to 50,000 marks per month. This silver is either coined in Bolivia, or is sent down partly to Arica for shipment, partly, but in very small quantities, through Arequipa, and partly through Cobjia.

The Huanchaca mineral district is giving at present 8,000 marks per month, but is expected to give double very shortly. This production is sent direct to England through Cobjia.

The Potosi mineral district is principally worked by a large company who own the main shaft; many mines are comprised in one, and the production may therefore be taken as coming from 8 or 10 mines. I have not, however, been able to ascertain the exact amount.

In Caracoles the number of mines denounced is very large, probably over 2,000; but of these there are not over 50 in active work, and perhaps another 100 by *pirquen*, which means the yielding of the working of a mine to labourers who work for their own profit, and thus maintain the owner's claim to the mine. Working a mine by *pirquen* is resorted to when the owner lacks capital or other means for the active working of the mine. Of the 50 mines in active work, some yield very little, but give a total production at present of about 50,000 marks per month. The production in the years 1873 to 1875 varied from 50,000 to 80,000 marks per month, but since then the principal mines that have worked have been almost exhausted in the upper region; and the present produce comes from a portion of the mines which have found metals at 120 to 150 metres level, and from the working of pillars in the upper region, as in the Deseada, Descubridora, and other mines, as also for the low metals which exist in abundance in the crumblings (*desmontés*).

It is only in one or two parts of Caracoles, and particularly in that which is called the "Isla," the second region has been as yet reached; and although scientific men consider the existence of argentiferous deposits in a second region as a certainty, it is still a matter of doubt. Should such a region exist, it will probably be found at a depth of from 200 to 300 metres. The production in Caracoles, therefore, depends,—

First, on finding in the present mines a second region on a lower level.

Secondly, on the continuance of "bonanza," or a paying lode in those mines which are at a level of 120 to 150 metres.

Thirdly, on economical working of metals, yielding from 15 to 30 marks per 64 quintals, and of which there is a great abundance on the surface of nearly all the mines.

And,

And, fourthly, on sufficient capital being raised for working a larger number of mines which are well situated, and have good lodes. At present capital is wanted. The financial condition of Chile is such that no capital can be now raised for working new mines, and the different companies are waiting till the problem of a second region be solved by one or two mines before going to a large expense in adjacent mines. When these adverse causes are removed, the produce of the Caracoles mines will be much increased. The average ley of the ores is said to be larger than that of the Nevada district, though the expenses attending carriage are greater at Caracoles, which is situated in a desert from whence freight to the coast is very high.

Production of Silver in Chile.

The exports from Atacama during 1874 and 1875 are as follows:—

	1874.	1875.
	<i>Dols.</i>	<i>Dols.</i>
Silver, in bars - - - -	4,326,433	5,356,160
*Silver and copper regulus - -	898,849	630,500
†Copper and silver ores - -	12,556	53,791
Silver ores - - - -	114,212	36,902
‡Copper, silver, and gold - -	108,160	36,240
Total dollars - - - -	5,460,210	6,113,593

* The value of copper in this item is about \$ 290,000 in 1874, and \$ 210,000 in 1875.

† Nearly all silver; copper of unimportant value.

‡ One half of this item may be taken as silver.

In this export, however, are included some ores from Bolivia which were imported into Chile for smelting, the following being the proportions of the Bolivia and Chile bar silver exported from Atacama:—

District where Ores were obtained.	1874.	1875.
	<i>Kilograms.</i>	<i>Kilograms.</i>
Bolivia - - - - -	4,444	21,047
Chile - - - - -	43,706	112,856
Total - - - - -	48,150	133,903

The high increase of export of Chile bar silver in 1875 is attributable to the extra production in the Andacollo and Chañaral mines. Increased facilities for amalgamation of ores were established in 1875 at Antofagasta, Bolivia, rendering the export to Chile unnecessary.

In the province of Atacama there were, in 1875, 199 mines of silver, 11 of copper and silver, 1 of silver and lead, and 1 of copper, silver, and gold—the greater number in active work, though some are worked by *pirquen*, as in Bolivia. The number of silver mines worked in other parts of Chile may be estimated at from 8 to 10.

The export of silver ores from Caldera during the present year (1876) has been as follows:—

	<i>Kilograms.</i>		<i>Kilograms.</i>
January - - - - -	4,401	July - - - - -	6,063
February - - - - -	3,313	August - - - - -	4,201
April - - - - -	876	September - - - - -	6,485
May - - - - -	167	October - - - - -	3,679
June - - - - -	3,290		
		Total, Jan. to Oct. - - -	32,475

Enclosure of Mr. *Drummond Hay's* No. 16, Commercial.

TABLE of COINS in *Chile*.

Class.	Names.	Value.		Ley.	Allowance for Difference in Weight.	Number of Coins in a Kilogram.	Legal Weight of each Coin.	Weight of Fine Gold or Silver.	Diameter of each Piece.
		In Silver Dollars.	In Cents.						
Gold	Condor - - -	10	1,000	0.900	0.0035	65.56087	<i>Grammes.</i> 15.2530	<i>Grammes.</i> 13.72770	<i>Millimetres.</i> 28.5
	Doblon - - -	5	500	"	"	131.12174	7.6265	6.86385	22
	Escudo - - -	2	200	"	"	327.80435	3.0506	2.74554	16.5
	Peso - - -	1	100	"	"	655.60870	1.5253	1.37277	14
Silver	Peso - - -	1	100	"	"	40.	25.0000	22.50000	37
	Medio Peso -	-	50	"	"	80.	12.5000	11.25000	30
	Venite - - -	-	20	"	"	200.	5.0000	4.50000	23
	Decimo - - -	-	10	"	"	400.	2.5000	2.25000	18
	Medio Decimo -	-	5	"	"	800.	1.2500	1.12500	15

VALUE of a Kilogram of GOLD or SILVER.

	Real Maximum Value.	Nominal Value.	Difference.	
			Per Kilogram.	Per 100.
	\$	\$	\$	\$
Gold - - - - -	715.000	728.4541	13.4541	1.8815
Silver - - - - -	42.926	44.4444	1.518	3.5363

RELATIVE VALUE of BULLION, Weight for Weight.

	Uncoi ned.	Coined.
Gold to Silver - - -	16.65	16.39
Gold to Copper - - -	1096.77	728.45
Silver to Copper - - -	65.84	44.44

Valparaiso, }
28th November 1876. }

J. de V. Drummond Hay,

ARGENTINE
REPUBLIC.

ARGENTINE REPUBLIC.

Enclosure of Mr. West's No. 5, Commercial, of 14th January 1877.

REPORT on the Silver Currency of the Argentine Republic, by one of the principal Bankers in Buenos Ayres.

THE circulating medium throughout the Argentine Republic is so badly arranged at present, that no system of unity exists save in form, and there is no coined money whatever of a national character. Formerly several of the provinces had mints, which, however, never acquired any importance, and were suspended even before the acceptance of the new Federal Constitution in 1860, that took from the provinces the right to coin money. From these circumstances it results that the want of a fixed standard in the country in the shape of an actual national coinage has obliged the authorities to grant a legal course to foreign silver.

Until 1873 the Republic made use of—

1. The *paper dollar* of Buenos Ayres.
2. The *peso plata* of 17 to the *onza de oro*, or gold ounce.
3. The *peso fuerte*, or hard dollar, of 16 to the *onza de oro*.
4. The *onza de oro*, equal to about 65 s. of our currency, and was generally taken as the monetary unit.

Nos. 2 and 3 may, however, be said to have been moneys of account only. No. 3 has at present no metallic representative, and has the same value as that officially given to the Spanish *duro*.

General Mitre, when President of the Republic in 1863, fixed the relative values of gold foreign coins in so many *pesos fuertes* each, excluding silver; which latter metal, although not a national legal tender, has been allowed to circulate in various provinces by the provincial authorities in the shape of Bolivian and Chilian silver coins.

In 1875 the National Government sanctioned a general *ley de monedas*, authorising the minting of gold and silver Argentine coins, fixing the proportion between silver and gold as 16·266 to 1.

The law contained clauses allowing the Government to establish in the meantime the relative values of foreign gold coins, taking for base the new Argentine *pesos fuerte* of $1\frac{2}{3}$ grammes, $\frac{9}{16}$ fine, or, say, $1\frac{1}{2}$ grammes fine gold, which has been done by decree of June 1876; the sovereign being equal to 4 *pesos fuertes* 88 cents, and the other coins in due proportion.

The National Government at the same time (June 1876) valued two or three of the most current silver coins; but as the optional clauses in the *ley de monedas* did not fix any proportion between gold and silver, and the values then given to these silver coins having been based upon a value of silver in the London market, which the continuous fall in the value of the metal in that market subsequently proved to be too high, they were in September 1876 reduced about 10 per cent.; the value of the Chilian silver dollar, for instance, being reduced from 92 cents to 82 cents, and most of the other silver coins in the same proportion.

The reduction thus made in the values of these so-called legal-tender coins of silver represents a relative proportionate value of silver to gold of 1 to 18·3.

However, as the value of silver in the London market has in the meantime again increased, the values which these silver coins have at present may at any time

time be altered, in conformity with the enhanced price of silver in London; as otherwise, were the higher prices ruling of late in European markets to be maintained, these coins would very probably be looked for as offering an advantageous means of remitting to England, and consequently be sent out of the country.

Until the Government thus gave legal values to these coins, silver was used to a very limited extent in the province of Buenos Ayres; and in fact, apart from payments to or by the Government, it is so yet; for, notwithstanding that it was the reputed object of the Government practically to establish a double standard, the commercial community and public generally have persistently refused to recognise the position thus wanted to be given to silver, and have consequently, except on very rare occasions, refused to admit or make use of it in their monetary transactions, almost all transactions being made in gold or paper money (at present inconvertible).

In the northern provinces of the Republic, and in Entre Rios and Corrientes as well, silver is the base of almost all commercial transactions, the Bolivian dollar $\frac{3}{4}$ fine being taken as the unit, and forming the money of account.

The coin by which this monetary system is represented is the $\frac{1}{2}$ -dollar or *cuatro*, an abbreviation of the 4-real piece, the dollar being divided into 8 reals. This coin is very unequal in point of purity, and has never had any legal value given to it by Government. Thus we see the anomaly of a coin which, it may be said, has hitherto been the only circulating medium in 13 out of 14 provinces of the Republic, having so far been completely ignored by the National Government in all measures relating to the monetary economy of the country.

This Bolivian coinage is very inconvenient, and, on account of its low and irregular standard, a very unsatisfactory coin; and the object is, no doubt, to displace it entirely, and introduce the *peso fuerte* in its stead, but such a change cannot but take place very slowly in a country like this.

As to the total amount of these Bolivian 4-real coins that may exist in the country, it is impossible to state with any exactness, as no returns exist relative to the amount in circulation, but may be roughly reckoned at some 4 or 5 million dollars, or 700,000 £. sterling.

The tendency is to a gradual export of this silver, principally to London; but the amount is too small to be of any great importance, as it is only on rare occasions that it can be done with any profit, and is liable to be checked at any moment by the arbitrary will of the Government raising the standard value. At present the National Government have established an inconvertible paper issue, and are attempting to get it into circulation throughout the whole Republic, and gradually displace the foreign silver, but have met with a considerable opposition in the northern provinces.

For some time past indications have been observable of a gradual establishment of a more satisfactory equilibrium; but the Argentine Republic has just emerged from a period, extending over several years, when it was constantly incurring foreign indebtedness considerably in excess of what its resources could balance. Its imports were in excess of its exports. Among the latter, silver has always figured to a small extent, either in the form of coins or silver in bars. There are, no doubt, many districts in the Republic where silver can be obtained by mining, but at present the quantity produced is very insignificant.

The richest silver district of all the Republic is Cerro Negro, near Chilesito, in the province of Rioja, where a surprising quantity of veins are found in the schist. Unfortunately, all the mining industry of this district is at present in the hands of small traders, as almost every inhabitant of Chilesito has his small mine, but none have the necessary intelligence or the required capital to enable them to work them with any degree of profit, and, owing to the great difficulties hitherto attending the conveyance of the necessary machinery so far inland, scarcely any capitalists have as yet attempted to exploit them.

Silver enters the country from the north from Bolivia and Chile, and from Chile and Peru on the west. The natural current is towards Buenos Aires,

ARGENTINE
REPUBLIC.

where, under favorable conditions of exchange, it is shipped in small quantities to England; but the comparatively low value that foreign silver coins at present have here will probably check to a great extent the amount from entering the country that they have hitherto been accustomed to receive. Altogether, the production of silver in this country, and the export of the metal from it, are of such a comparatively small extent as quite impossible to be of any consideration, so far as can affect in any way the objects which prompted the letter addressed by the India Office to the Foreign Office.

JAPAN.

J A P A N.

(No. 16.)

Sir Harry S. Parkes to the Earl of Derby.

(Extract.)

Yedo, 22 January 1877.

COMPARED with other countries, the production and consumption of silver in Japan is very small. In Mr. Plunkett's Report * on the mines of Japan, 2,600 *kwamme*,† valued in sterling at 79,625 *l.*, is named as the estimate of the amount of silver produced in Japan in 1874; and a return which has just been furnished me by the Minister of Public Works shows that the amount of silver obtained from all mines, both Government and private, during the year 1876 is less than the above estimate, being only 2,113 *kwamme*, or 255,213 ounces. It is expected that the return of the present year will show some increase on the above amount.

I have endeavoured to trace the movements of silver in Japan during the last 5 years, and I enclose a Table containing all the information I have yet been able to collect through the Japanese Government. According to this Table, the importation of silver appears to have been almost entirely confined to Mexican dollars, and to have amounted only to \$7,250,000 during the 5 years; but I question whether the importations of silver bullion which is received both from San Francisco and China are even approximately stated in this Table. The export side shows that very nearly the same amount of Mexican dollars were exported as imported, as also that rather more than 7,000,000 of Japanese silver coin, old and new, and silver bullion to the amount of \$822,140, were exported. The value of the total export of silver is given at \$15,945,668, against a total import of \$7,376,944, but I am afraid that the latter sum is not correct.

As the movement of gold in Japan may have some bearing upon the question, I append a second Table, showing that during the same period new Japanese gold coin has been exported (as bullion, it may be presumed) to the value of \$21,403,605, and *nibukin* coin (an alloy of gold and silver) to the value of \$6,220,779; also that gold bullion has been imported to the amount of \$2,005,322, and exported to the amount of \$1,867,947.

In respect to coinage, I beg to enclose the last Report ‡ of the Commissioner of the Japanese Mint, showing (on page 10) that gold coin has been coined at the Japanese Mint to the value of \$50,678,082, and silver coin to the value of \$17,021,316, since the opening of the Mint (in August 1871) to the 30th June 1876. The value of the silver coined during the year 1875-76 was only \$1,963,037.

I have, &c.
(signed) H. S. Parkes.

* Pages 155-6 Appendix to Report from the Select Committee on Depreciation of Silver (C. 338 of 1876).

† 1 *kwamme* = 8½ lbs.

‡ Second Annual Report of the Commissioner of the Imperial Mint, Osaka, Japan, for the year ending 30th June 1876. (The Report has not been printed with these Papers.)

Enclosure 1 in Despatch from Sir *H. S. Parkes*, No. 16, of 22 January 1877.

MOVEMENT of SILVER in JAPAN from 1872 to 1876.

IMPORTS.		EXPORTS.	
	Value in Dollars.		Value in Dollars.
1872:		1872:	
Mexican dollars - - - -	3,654,966	Old silver coins - - - -	1,758,638
		New ditto - - - -	21,715
		Mexican dollars - - - -	15,756
			1,796,109
1873:		1873:	
Mexican dollars - - - -	1,051,444	Old silver coins - - - -	1,069,843
Silver bullion - - - -	2,424	New ditto - - - -	19,430
		Silver bullion - - - -	822,140
		Mexican dollars - - - -	591,544
	1,053,868		2,502,957
1874:		1874:	
Mexican dollars - - - -	1,021,826	Old silver coins - - - -	1,555,476
Silver bullion - - - -	13,130	New ditto - - - -	930,598
		Mexican dollars - - - -	3,349,343
	1,034,956		5,835,417
1875 (first Six Months):		1875 (first Six Months):	
Mexican dollars - - - -	54,718	Old silver coins - - - -	992,785
Silver bullion - - - -	4,429	New silver <i>yen</i> 1 - - - -	695,728
		Mexican dollars - - - -	611,805
	59,147		2,300,318
1875-76 (Twelve Months from 1st July 1875):		1875-76 (Twelve Months from 1st July 1875):	
Mexican dollars - - - -	1,471,453	Old silver coins - - - -	777,009
Silver bullion - - - -	95,713	New ditto - - - -	146,099
Trade dollars - - - -	6,841	Trade dollars - - - -	86,013
		Mexican dollars - - - -	2,501,746
Value in Dollars - - - -	1,574,007	Value in Dollars - - - -	3,510,867

RECAPITULATION.

	IMPORTS.	EXPORTS.
	Value in Dollars.	Value in Dollars.
1872 - - - - -	3,654,966	1,796,109
1873 - - - - -	1,053,868	2,502,957
1874 - - - - -	1,034,956	5,835,417
1875 (half-year to 1st July) - - - -	59,147	2,300,318
1875-76 (one year to 1st July) - - - -	1,574,007	3,510,867
Value in Dollars - - - -	*7,376,944	†15,945,668

* IMPORTS.	† EXPORTS.
	Value in Dollars.
Mexican dollars - - - -	7,254,407
Silver bullion - - - -	115,696
Trade dollars - - - -	6,841
Value in Dollars - - - -	7,376,944
Mexican dollars - - - -	7,070,194
Silver bullion - - - -	822,140
Trade dollars - - - -	86,013
Old coins - - - -	6,153,751
New ditto - - - -	1,813,570
Value in Dollars - - - -	15,945,668

Enclosure 2 in Despatch from Sir *H. S. Parkes*, No. 16, of 22 January 1877.

MOVEMENT of GOLD in JAPAN from 1872 to 1876.

Export of New Gold Coin.

	Value in Dollars.
1872 - - - - -	142,646
1873 - - - - -	2,013,602
1874 - - - - -	7,597,753
1875 (half-year to 1st July) - - - - -	6,058,281
1875-76 (one year to 1st July) - - - - -	5,591,343
Value in Dollars - - -	21,403,625

Export of *Nibukin* Coin.

1872 - - - - -	2,542,140
1873 - - - - -	600,453
1874 - - - - -	528,537
1875 (half-year to 1st July) - - - - -	1,051,818
1875-76 (one year to 1st July) - - - - -	1,497,831
Value in Dollars - - -	6,220,779

GOLD BULLION.

	IMPORTS.	EXPORTS.
	Value in Dollars.	Value in Dollars.
1873 - - - - -	1,977,707	—
1874 - - - - -	1,100	—
1875 (half-year to 1st July) - - - - -	24,899	24,240
1875-76 (one year to 1st July) - - - - -	1,616	1,843,707
Value in Dollars - - -	2,005,322	1,867,947

RETURN to an Address of the Honourable The House of Commons,
dated 31 July 1877 ;—for,

“COPY of a LETTER from the GOVERNMENT of INDIA, forwarding REPORTS
by the BENGAL and BOMBAY CHAMBERS of COMMERCE, regarding the
Effects of the Fall in the Price of SILVER on Trade and Remittances and
on Prices in INDIA (in continuation of Parliamentary Paper, No. 120, of the
present Session).”

India Office, }
10 August 1877. }

GEORGE HAMILTON,
Under Secretary of State.

(*Lord George Hamilton.*)

Ordered, by The House of Commons, to be Printed,
11 August 1877.

COPY of a LETTER from the GOVERNMENT of INDIA, forwarding REPORTS by the BENGAL and BOMBAY CHAMBERS of COMMERCE, regarding the Effects of the Fall in the Price of SILVER on Trade and Remittances and on Prices in INDIA (in continuation of Parliamentary Paper, No. 120, of the present Session).

LETTER from the Government of India to the Secretary of State for India,—
No. 178, Financial (Accounts),

Simla, 18 June 1877.

IN continuation of our Despatch No. 49, dated the 9th February 1877, we have the honour to forward the accompanying reports, by the Bengal and Bombay Chambers of Commerce, regarding the effects of the fall in the gold-price of silver on trade and remittances, and on prices in India.

We have the honour, &c.

Lytton.

F. P. Haines.

E. C. Bayley.

A. J. Arbuthnot.

A. Clarke.

J. Strachey.

E. B. Johnson.

W. Stokes.

From *H. W. I. Wood*, Esq., Secretary to the Bengal Chamber of Commerce,
to the Secretary to the Government of India, Financial Department.

Calcutta, 10 March 1877.

I AM directed by the Committee of the Chamber of Commerce to acknowledge the receipt, with its enclosures, of your letter No. 162 of the 16th January, requesting the opinion of the Chamber on the effect which the fall in the price of silver may have had on trade, on remittances, and on prices in India.

I am further directed to inform you in reply that, in the opinion of the Committee, the effect of the depreciation in the value of silver has been to cause heavy losses to all importers of piece-goods, the values of which, while they remained firm in England, scarcely advanced here at all, and the proceeds when remitted home at the low exchange were insufficient to cover original cost. The evil was aggravated by the uncertainty that attended the course of the exchange market, which prevented importers having any solid basis of calculation for their transactions, and drove them in self-defence to secure their exchange beforehand. The effect on prices of exports was to raise their values in the Calcutta market, as the low rate of exchange enabled the exporter to pay a higher rupee price without increasing the "laying-down cost" or sterling value. This additional price was the profit made by the "native middlemen," or the holders of produce in the port of exports; the Committee have grave doubts whether any portion of this extra price ever found its way

to the ryot and producer. Had the depreciation lasted longer, or should it again occur, the native merchant would no doubt have to share this profit with the producer, as the depreciation of a currency, if continued sufficiently long, must raise the value of all articles, even those of daily and necessary use, and the ryot would reap the benefit of such universal rise in enhanced rates for his produce. But they would neither of them gain much in the long run, as, though they would both get higher prices for the produce of the land or of their labour, they would have to pay equivalently higher rates for all the necessaries or luxuries that they would have to buy from others. The native dealer is quick to take advantage of every circumstance that would warrant higher prices from the exporter, but slow in recognising the necessity of dropping prices, though he is sharp enough in demanding lower rates when he himself is the purchaser from the ryot or producer. It will be seen from this that prices may rise materially, and even continuously, on the European exporter at the large marts, and no benefit accrue to the cultivator, producer, or manufacturer in the interior of the country, till prices of all necessaries of life, or a general rise throughout the country, enable him to demand an enhanced rate. All articles of purely or mainly of European production are in some measure exceptions to this rule. Tea, for example, is grown only by Europeans; and as it is sold direct to the exporter at public auction, no middleman is employed, and the tea-planter reaps all the benefit of such extra price as the lower rate of exchange enables the exporter to pay. The coolies on the gardens are, however, under agreement, and do not participate in this. In indigo and silk, which are almost entirely of European production or manufacture, no middlemen are, as a rule, employed, as those articles are sold here by public auction, or shipped to European markets on owners' account. The proprietor of the factory or filature gains the advantage of the rise or price, but this does not filter down to the native cultivator, except after some time, when prices have generally risen for other articles as well. On the whole, therefore, it may be assumed as a general rule that the depreciated value of silver and the consequent fall in the rate of sterling exchange made itself at once felt, wherever the holder of produce came into close contact with the exporter; but its effect was not so apparent in the mofussil, nor did it last sufficiently long to admit of the lower labouring or working classes reaping any benefit.

To that large class of Europeans with fixed incomes, who are forced to supply many of their daily necessary wants from stores of European shopkeepers, and who are under necessity of making remittances home for their families, the hardship has been very great. They found not only that the increased cost of their remittances seriously impaired the balance of income retained for their own support, but that even this reduced balance was still further cut into by the higher prices the European shopkeeper put on his goods. Though exchange has since risen, these higher prices are still retained, owing to the uncertainty as to the future. The hardship, therefore, to all those requiring to make remittances to England, and who are compelled to use goods of English manufacture, continues with little abatement.

The Secretary of the Bombay Chamber of Commerce to the Secretary to the Government of India, Financial Department.

Bombay, 15 May 1877.

I AM directed by the Committee of the Bombay Chamber of Commerce to acknowledge the receipt of your letter No. 162, of the 16th January last (Financial Department), requesting that the Governor General in Council may be favoured with the opinion of the Chamber on the effect which the fall in the price of silver may have had on trade, on remittances, and on prices in India, and intimating that any facts which throw any light on the subject should be given to the latest date possible.

The

The Chamber has now the honour to enclose the following Statements:—

Statement (A), showing the total value of the imports into and the exports from British India, together with the total allotments of Council Bills on India, and the balance of encasements and retransfers to India of Indian Government Paper, in each month in the years 1874, 1875, and 1876, and in January and February 1877.

Statement (B), showing the exports of the principal articles from Bombay Presidency to foreign ports from January 1874 to March 1877, with the average prices of the articles in Bombay, the value of Bar Silver in London, and the rates of exchange and freight current each month in Bombay.

Statement (C), showing the values of the principal articles imported into the Bombay Presidency for the same period.

Statement (D), Nos. 1 and 2, showing the average price each month of linseed and rapeseed in Bombay and in London, during the years 1870-76, and the first quarter of 1877, with the current rate of exchange; and No. 3, showing the average price each month of Fair Dhollera Cotton in Bombay and in Liverpool, during the years 1858-60 and 1874-76, and in the first quarter of 1877, with the current rate of exchange.

NOTE.—The years taken in Statement (D), No. 3, are selected as giving average values of cotton in the years immediately preceding the American Civil War, and in the last three years, the years of the War, and subsequently, when high abnormal prices ruled, being passed over, as affording no just basis of comparison; and

Statement (E), Nos. 1 to 19, showing the prices-current of food-grains from January 1874 to March 1877, at Bombay, Ahmedabad, Kaira, Surat, Broach, Tanna, Kolaba (Alibagh), Khandeish, Nasik, Ahmednuggar, Poona, Sholapore, Kaladgee, Sattara, Belgaum, Dharwar, Rutnagirri, Kanara (Carwar), and Punch Mahals (Godhra).

The Chamber considers it essential to the inquiry that the monthly fluctuations of the balance of trade of British India, during the last three years, should be shown, not only as being interesting in themselves, but as bearing out the views of the Chamber on the other Statements appended, which relate to trade and prices in the Bombay Presidency only. These fluctuations are, with other particulars, shown in Statement (A).

From Statement (B), it will be seen that one effect of the fall in the price of silver relatively to gold was to develop the export of many articles of produce which had not been of large export before; the only important exceptions, indeed, being cotton, the export of which fell off, because of the deficiency of the crop, combined with the increased consumption of the local mills, and gingelly-seed, which is chiefly grown in Khandeish; and, being an early crop, the injurious effects of the drought upon it are manifest in the diminished exports during the latter months of 1876. The great increase which took place in the exports of the other principal articles during the year 1876 will be found in the following table of the exports in the last three years:—

—	Cotton.	Wool.	Wheat.	Linseed.	Rapeseed.	Gingelly Seed.	Myra-bollams.	Gold.	Silver.
	<i>Cwt.</i>	<i>Cwt.</i>	<i>Cwt.</i>	<i>Cwt.</i>	<i>Cwt.</i>	<i>Cwt.</i>	<i>Cwt.</i>	<i>Rs.</i>	<i>Rs.</i>
1874	4,374,991	144,473	790,609	827,437	5,619	235,362	144,701	21,78,000	39,81,491
1875	4,358,432	136,471	733,458	1,594,958	213,214	451,632	135,669	3,65,896	77,56,640
1876	3,410,951	149,264	1,235,577	2,671,689	408,187	340,266	150,480	1,40,56,960	2,07,03,608

The attention of His Excellency the Governor General in Council will doubtless

less be drawn to the extraordinary increase in the export of gold, which this Statement shows as having occurred in 1876, and particularly during those months when exchange was so depressed. This is a feature in the trade quite unknown before, the flow of gold having always hitherto been *to* India, and never *from* it. The imports exceeded the exports until the end of May last, when the average rate of exchange for the month had not fallen below 1 s. 8 $\frac{5}{16}$ d. But, as exchange declined, the exports of gold increased, amounting in July to 211,000 l., in August to 334,000 l., and in September to 232,000 l. The rate of exchange, taking the average of each month, did not exceed 1 s. 8 d. again until towards the end of October, when a decided improvement set in, and the consequences became apparent in the sudden falling-off in the exports of gold from 33 lakhs in August to a little over 2 lakhs in November and December, and to Rs. 3,900 altogether in the three months ending 31st March 1876. Turning now to Statement (C), it will be seen that the imports of gold in January 1877, when the average rate of exchange stood at 1 s. 10 d., rose to 69,810 l.; in February, when exchange stood at 1 s. 9 $\frac{3}{8}$ d., to 305,680 l.; and in March, when exchange stood at 1 s. 9 $\frac{1}{8}$ d., to 210,530 l. The imports during March were all ordered when exchange stood much higher than the average rate here given, and when it fell to near that point all orders ceased for English gold, none of which has since been imported. It has now been pretty well ascertained that the demand for gold from Europe for actual consumption practically ceases when the price rises to about 18 rupees per tola, or 1 s. 9 $\frac{3}{8}$ d., and it begins to be offered again for export at very little over 18 rupees, when it lays down in London at 1 s. 9 d. It is, however, a remarkable feature that these large imports of gold were made at prices higher than used to be paid for gold, or, in other words, gold has generally only been imported in quantity when exchange was considerably above the rates ruling from January to March; and this we find is owing to the very high and unprecedented prices which were paid for gold for export during the extreme depression in exchange, enabling the country to re-buy what it had sent away, and to give high prices, although not nearly so high as the prices at which it had sold. The country, in fact, sold its gold when prices were high, and re-bought when they were low, though they were still higher than in former days it could afford to buy at.

It is obvious that this operation could not have been completed satisfactorily if it had been felt that the purchasing power of the rupee with respect to articles of general consumption, such as the ordinary food of the people, had become impaired, and the figures contained in the Statement (E) prove that the prices of food-grains did not rise till the latter months of 1876. The rise which then took place, and which still continues, is entirely accounted for by the famine prevailing in the Southern Mahratta country and in Madras. The fall in the price of silver relatively to gold did not weaken the belief of the people of India in the one standard of value with which they are familiar, namely, the rupee; on the contrary, it only stimulated them to sell all the gold they could lay hands upon, in order to avail themselves of the opportunity of acquiring a greater number of rupees than usual in exchange for it. And it will doubtless occur to his Excellency in Council, that these proofs of the keenness with which the natives of India detect and profit by any movements in the relative value of gold and silver show that the difficulties which other countries have experienced in adopting a double standard would be no less formidable in India; and his Excellency will further no doubt feel, as the Chamber does, that this fact alone, apart from considerations of sound policy, affords a sufficient answer to the many proposals (some of them emanating from quarters sufficiently influential to be entitled to a hearing) to raise the rate of exchange by attempting in various ways to give the rupee a value different from its metallic value.

While the effect of the depreciation of silver relatively to gold was to stimulate exports, its natural tendency, on the other hand, was to curtail the import trade relatively to the increased exports. The following comparative Table, extracted from Statement (A), of the exports and imports of British India, during the six months ending with October 1876 (the period of greatest depression in exchange), with the exports and imports in the same period of 1875 and 1874, brings this point out more clearly:—

STATEMENT (A).—From 1st May to 31st October.

	Export of Merchandise.	Imports of Merchandise.
	<i>Rs.</i>	<i>Rs.</i>
1874 - - - - -	24,67,62,716	17,65,22,328
1875 - - - - -	25,38,14,029	17,19,09,779
1876 - - - - -	27,97,39,099	17,33,31,525

Statements (B) and (C), which show from month to month the effect of the varying exchange on the exports and imports of this Presidency, also illustrate it. It will be observed that although the imports relatively to exports were smaller than those in the years of comparison, they were actually in some instances larger, as will be seen from the following Table, showing the values of the main articles imported into Bombay in the years 1874, 1875, and 1876:—

	Cotton Piece Goods.	Cotton Yarns.	Metals.	Sugar and Sugar Candy.	Raw Silk.	Silver.	Gold.
	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>
1874 -	4,53,62,404	78,45,475	81,17,687	48,95,230	73,27,947	4,00,72,724	1,22,46,639
1875 -	4,02,29,944	55,89,182	1,17,91,294	64,87,786	58,72,511	3,08,46,713	1,11,41,630
1876 -	5,28,56,285	68,88,362	1,49,39,768	74,15,770	48,37,340	5,67,06,139	68,27,964

Of these articles, cotton piece-goods and yarns and metals come principally from countries having a gold standard only; and as these are the great articles of consumption in India when the country is in a prosperous state, the increased imports in 1876, which was generally a year of low exchanges, would appear to show how largely the consuming power of the country may be augmented by the stimulus given to its export trade. But although the total values of piece-goods and metals for the whole of the year 1876 exceed those of the year 1875 and those of 1874, it will be observed that the imports were greatly curtailed during those months when exchange was much depressed.

Remittances, depending on the balances of payments to be made, are affected as the increase in imports falls short of, or exceeds, the increase relatively in exports. Under a temporary fall in silver, they are curtailed as much as possible, for anything tending to restrict the import trade necessarily abridges remittances. The Chamber, however, has no exact information as to the actual remittances made in 1876 and in previous years.

With regard to the effect of the depreciation of silver upon prices, the Chamber desires to observe that the famine, which would doubtless have had the effect of raising the prices of food generally in the Presidency, whether silver was depreciated or not, impairs in its effects the utility of the Statements marked (E) in respect of the prices given in the last six months of each, inasmuch as it is impossible to say from these statements if any portion of the rise in prices of most of the food-grains which took place in October—when the distress began—was due to the depreciation in silver. The rise in the price of wheat—which, however, besides being a food-grain, is now one of the main articles of export, and the price of which is therefore liable to be affected by the fluctuations in exchange—was in part distinctly due to the depreciation of silver,

and to the tendency to higher prices in Europe. It is, however, generally believed that—excluding the effects of the famine on prices—the purchasing power of the rupee in respect of ordinary articles of consumption, such as the food of the people, remains undiminished. But the prices of articles of export, such as wheat, linseed, and rapeseed, are governed to a great extent by exchange. Statements (D) Nos. 1 and 2 show that the rise in the prices of linseed and of rapeseed began about July 1876; but other causes, besides the decline in exchange, were at work to aid the advance—namely, the scarcity of seeds in Bombay, in consequence of the block of traffic on the G. I. P. Railway, which had the effect of retarding the arrival of crops from Nagpore and similar distant centres of the trade,—the deficient crops in the districts affected by the drought adjacent to Bombay, and an advance in the prices of seeds in Europe. Statements (D) show how this country received a much larger sum in silver for its produce, though the value in gold may not have increased, or whilst it may even have fallen. A few instances are selected from these Statements to illustrate this point, though the rise in the prices of seeds in Europe, which began when exchange was very low, prevents us from exhibiting it generally with greater clearness:—

STATEMENT (D)—No. 1, LINSEED.

—	Price per Cwt. in Bombay.	Exchange.	Price in London.
	<i>Rs. a. p.</i>	<i>s. d.</i>	<i>Rs. a. p.</i>
March 1874 - -	5 10 -	1 11½	9 - -
August 1875 - -	5 10 -	1 9½	7 11 5
August 1876 - -	5 11 6	1 7½	8 1 7

STATEMENT (D)—No. 3, COTTON.

—	Price per Cwt. in Bombay.	Exchange.	Price per Cwt. in Liverpool.
	<i>Rs. a. p.</i>	<i>s. d.</i>	<i>Rs. a. p.</i>
June 1875 - -	25 5 -	1 9¾	26 12 5
August „ - -	23 6 6	1 9½	25 2 10
August 1876 - -	23 7 6	1 7½	24 14 10
November 1876 -	25 - -	1 8½	26 3 5

The Chamber is of opinion that as the depreciation in silver did not continue long enough to affect the prices of articles of general consumption, such as the ordinary food of the people, the result has been a clear gain to the producer, and of great benefit to the country, greatly increasing the export trade, and giving a great impetus to the internal one, as may be seen from the increased railway traffic. Another advantage has been that of securing a large quantity of silver at cheap prices: in other words, an enormous quantity of produce has been sold, and value received in return which otherwise would never have been received. The facts show that a heavy fall in exchange, so far from being an unmitigated evil, as it is too often considered by those who do not look below the surface, really confers great benefits on the country, as tending to develop enormously its agricultural resources, and to stimulate its industries. And it must not be forgotten that this effect does not altogether disappear with the cause which gave it birth, for trade, once induced to run in certain channels, often

often continues to flow in them long after the original cause has ceased to operate.

On the other hand, trade is injuriously affected by the fluctuations in the silver market, and by the uncertainty which hangs over the future. The silver market may be said, from various causes introduced of late years, to have become dependent on an entirely new set of influences, the force of which cannot yet be accurately measured; and until the market adjusts itself to these influences, and finds a new and comparatively stable basis (as it will in time, though, it is to be feared, not for some years to come), fluctuations will continue to be frequent, and to embarrass the trade of all countries working in a silver standard of value; and the Chamber would take this opportunity most respectfully to press on his Excellency's attention the enormous influence which is exercised by his Excellency's Government on the silver market, and on the rate of exchange. As a seller of bills sufficient to finance for about one-fourth of the whole exports of British India, the Secretary of State for India's operations cannot but have a most important effect, and according as his sales are regular, and for amounts declared sufficiently beforehand, or irregular and for changing amounts, so will the fluctuation and embarrassment consequent thereon be enormously influenced. The Chamber trusts, therefore, that his Excellency's Government will give the weight it deserves to this important fact, and that their endeavours in devising and carrying out their loan and bill operations will be specially directed to causing as little agitation as possible to a market which, whilst the silver market is in its present transition state, can scarcely fail to have always within it the elements of excitement.

In conclusion, I am directed to say that all inquiries with a view to eliciting further information on the various new conditions affecting silver cannot but be very useful. The Chamber observes with much satisfaction the inquiries set on foot through the Foreign Office, and it hopes that all information obtained will be made public as soon as possible.

I have, &c.
(signed) *J. Gordon*, Secretary.

STATEMENT (A.)

SHOWING the TOTAL VALUE of the IMPORTS into, and EXPORTS from, *British India*, together with the GOVERNMENT PAPER to the LONDON REGISTER and Re-transfers to *India*,

In the Month of	IMPORTS.			EXPORTS.			
	Merchandise.	Treasure.	TOTAL.	Merchandise.	Treasure.	TOTAL.	
1874:	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
January - - -	3,17,97,806	36,98,029	3,54,95,835	5,70,88,820	5,21,277	5,76,10,097	1
February - - -	2,85,90,403	1,58,81,201	4,44,71,604	5,32,63,285	12,99,587	5,45,62,872	2
March - - -	3,29,93,023	1,41,33,873	4,71,31,896	6,53,85,773	14,41,085	6,68,26,858	3
April - - -	2,31,41,289	1,34,36,070	3,65,77,359	6,08,28,385	10,50,495	6,18,78,880	4
May - - -	2,70,69,582	1,53,82,139	4,24,51,721	5,91,79,754	93,020	5,92,72,774	5
June - - -	2,83,57,533	39,51,993	3,23,09,526	4,52,26,301	15,88,461	4,68,14,762	6
July - - -	3,23,82,892	21,46,390	3,45,29,282	4,06,13,032	18,24,950	4,24,37,982	7
August - - -	2,81,04,644	16,34,583	2,97,39,227	3,21,78,895	23,03,300	3,44,82,195	8
September - - -	2,66,92,158	34,38,828	3,01,30,986	3,74,78,113	12,91,436	3,87,69,549	9
October - - -	3,37,15,519	29,50,420	3,66,65,939	3,20,86,621	17,66,900	3,38,53,521	10
November - - -	3,10,76,326	57,77,568	3,68,53,894	3,33,27,193	19,96,850	3,53,24,043	11
December - - -	3,10,71,017	31,75,837	3,42,46,854	4,67,00,392	13,65,830	4,80,66,222	12
TOTAL for 12 Months	35,51,92,192	8,56,11,931	44,08,04,123	56,33,56,564	1,65,43,191	57,98,99,755	13
1875:							
January - - -	3,24,75,076	1,28,59,087	4,53,34,163	5,55,29,408	9,75,297	5,65,04,705	14
February - - -	2,87,28,185	1,00,94,753	3,88,22,938	5,25,79,999	7,62,984	5,33,42,983	15
March - - -	3,66,76,524	65,62,798	4,32,39,322	6,74,36,546	12,33,568	6,86,70,114	16
April - - -	3,14,49,813	38,11,599	3,52,61,412	6,71,58,603	6,35,910	6,77,94,513	17
May - - -	2,78,20,610	23,88,907	3,07,09,517	6,58,77,969	1,91,115	6,60,69,084	18
June - - -	3,21,30,768	55,16,187	3,76,46,955	5,23,93,312	15,23,251	5,39,16,563	19
July - - -	3,16,15,709	50,59,281	3,66,74,990	3,80,19,240	43,31,382	4,23,50,622	20
August - - -	2,44,30,593	27,87,220	2,72,17,813	3,43,14,577	5,15,828	3,48,30,405	21
September - - -	2,97,13,164	1,04,90,148	4,02,03,312	3,45,22,586	16,48,035	3,61,70,621	22
October - - -	2,61,98,935	26,03,943	2,88,02,878	2,86,86,345	27,89,700	3,14,76,045	23
November - - -	3,29,80,008	18,73,420	3,48,53,428	3,82,28,106	19,00,500	4,01,28,606	24
December - - -	3,55,33,851	40,19,672	3,95,53,523	4,77,13,075	15,90,361	4,93,03,436	25
TOTAL for 12 Months	36,97,53,236	6,85,57,015	43,83,20,251	58,24,59,766	1,80,97,931	60,05,57,697	26
1876:							
January - - -	3,60,08,635	31,34,799	3,91,43,434	5,58,37,679	25,37,014	5,83,74,693	27
February - - -	3,72,86,591	26,86,367	3,99,72,958	5,72,70,096	30,39,127	6,03,09,223	28
March - - -	4,04,34,167	81,32,181	4,85,66,348	6,06,03,454	13,00,140	6,19,03,594	29
April - - -	3,04,15,711	96,33,538	4,00,49,249	5,62,51,334	17,24,716	5,79,76,050	30
May - - -	2,99,07,003	1,01,64,565	4,00,71,568	6,36,32,056	29,46,435	6,65,78,491	31
June - - -	2,89,95,067	59,48,271	3,49,43,338	5,45,40,005	27,16,046	5,72,56,051	32
July - - -	2,28,97,862	60,79,507	2,89,77,369	3,93,56,459	45,10,048	4,38,66,507	33
August - - -	2,80,19,579	39,15,619	3,19,35,198	3,89,70,043	71,10,955	4,60,80,998	34
September - - -	2,84,58,388	45,33,593	3,29,91,981	4,30,81,036	70,95,201	5,01,76,237	35
October - - -	3,50,53,626	1,43,57,858	4,94,11,484	4,01,59,500	33,50,426	4,35,09,926	36
November - - -	3,45,34,268	1,06,80,999	4,52,15,267	4,35,12,936	36,78,622	4,71,91,558	37
December - - -	3,20,98,074	1,06,37,648	4,27,35,722	4,65,75,626	20,29,298	4,86,04,924	38
TOTAL for 12 Months	38,41,08,971	8,99,04,945	47,40,13,916	59,97,90,224	4,20,38,028	64,18,28,252	39
1877:							
January - - -	3,29,97,072	1,35,98,158	4,65,95,230	5,63,54,659	22,02,703	5,85,57,362	40
February - - -	3,28,83,325	1,57,19,891	4,86,03,216	6,14,84,560	8,99,121	6,23,83,681	41
March - - -	-	-	-	-	-	-	42

STATEMENT (A.)

TOTAL ALLOTMENTS of COUNCIL BILLS on *India*, and the BALANCES of ENFACEMENTS of INDIAN in each Month, in the Years 1874, 1875, and 1876, and in January and February 1877.

BALANCE OF TRADE.		COUNCIL BILLS.	INDIAN GOVERNMENT PAPER OUTSTANDING ON LONDON REGISTER.		BALANCE OF ENFACEMENTS AND RE-TRANSFERS TO INDIA.	
Total Excess of Imports, in- cluding Treasure.	Total Excess of Exports, in- cluding Treasure.	Total Allotments on India.	Date.	Amount.	Excess London to India.	Excess India to London.
Rs.	Rs.	Rs.	1873 : 31 December - -	Rs. 14,22,93,100	Rs.	Rs.
1 - -	2,21,14,262	1,40,00,000	1874 : 31 January - -	14,51,22,500	- -	28,29,400
2 - -	1,00,91,268	1,00,00,000	28 February - -	14,49,66,400	1,56,100	-
3 - -	1,96,94,962	1,00,00,000	31 March - -	14,56,51,500	-	6,85,100
4 - -	2,53,01,521	90,00,000	30 April - -	14,45,29,500	11,22,000	-
5 - -	1,68,21,053	40,00,000	31 May - -	14,37,27,700	8,01,800	-
6 - -	1,43,05,236	40,00,000	30 June - -	14,26,82,700	10,45,000	-
7 - -	79,08,700	80,00,000	31 July - -	14,34,42,300	- -	7,59,600
8 - -	47,42,968	1,00,00,000	31 August - -	14,52,75,300	- -	18,33,000
9 - -	86,38,563	1,00,00,000	30 September - -	14,52,75,300	-	-
10 28,12,418	- - -	1,00,00,000	31 October - -	15,17,55,600	- -	64,80,300
11 15,29,851	- - -	1,05,00,000	30 November - -	15,31,36,800	- -	13,81,200
12 - -	1,38,19,368	1,10,00,000	31 December - -	15,29,21,700	2,15,100	-
13 43,42,269	14,34,37,901	11,05,00,000	- - -	- - -	33,40,00,000	1,39,68,600
14 - -	1,11,70,542	1,25,00,000	1875 : 31 January - -	15,14,93,160	14,28,540	-
15 - -	1,45,20,045	1,40,00,000	28 February - -	14,97,29,360	17,63,800	-
16 - -	2,54,30,792	1,40,00,000	31 March - -	15,17,65,460	- -	20,36,100
17 - -	3,25,33,101	1,40,00,000	30 April - -	15,20,74,760	- -	3,09,300
18 - -	3,53,59,567	1,40,00,000	31 May - -	15,17,00,760	3,74,000	-
19 - -	1,62,69,608	1,30,00,000	30 June - -	15,23,87,960	- -	6,87,200
20 - -	56,75,632	1,20,00,000	31 July - -	15,22,05,560	1,82,400	-
21 - -	76,12,592	1,35,00,000	31 August - -	15,27,56,260	- -	5,50,700
22 40,32,691	- - -	1,34,17,000	30 September - -	15,34,78,960	- -	7,22,700
23 - -	26,73,167	1,45,83,000	31 October - -	15,43,38,660	- -	8,59,700
24 - -	52,75,178	1,40,00,000	30 November - -	15,51,68,860	- -	8,30,200
25 - -	97,49,913	1,40,00,000	31 December - -	15,51,05,760	63,100	-
26 40,32,691	16,62,70,137	16,30,00,000	- - -	- - -	38,11,840	59,95,900
27 - -	1,92,31,259	1,40,00,000	1876 : 31 January - -	15,49,45,830	1,59,930	-
28 - -	2,03,36,265	- - -	29 February - -	15,46,52,430	2,93,400	-
29 - -	1,33,37,246	3,00,000	31 March - -	15,40,37,430	6,15,000	-
30 - -	1,79,26,801	50,00,000	30 April - -	15,13,44,130	26,93,300	-
31 - -	2,65,06,923	1,08,30,000	31 May - -	14,93,67,830	19,76,300	-
32 - -	2,23,12,713	1,09,77,940	30 June - -	14,69,44,630	24,23,200	-
33 - -	1,48,89,138	1,19,60,000	31 July - -	14,39,78,130	29,66,500	-
34 - -	1,41,45,800	1,95,52,000	31 August - -	14,22,30,530	17,47,600	-
35 - -	1,71,84,256	1,40,00,000	30 September - -	14,06,06,730	16,23,800	-
36 59,01,558	- - -	1,40,00,000	31 October - -	13,94,24,330	11,82,400	-
37 - -	19,76,291	1,40,00,000	30 November - -	13,83,56,130	10,68,200	-
38 - -	58,69,202	1,40,00,000	31 December - -	13,82,54,580	1,01,550	-
39 59,01,558	17,37,15,894	12,86,19,940	- - -	- - -	1,68,51,180	-
40 - -	1,19,62,132	1,46,60,000	1877 : 31 January - -	13,82,29,580	25,000	-
41 - -	1,37,80,465	56,43,000	28 February - -	14,10,32,480	- -	28,02,900
42 - -	- - -	70,00,000	31 March - -	14,05,34,780	4,97,700	-

have not yet been received by the Chamber from the Government of India.

STATEMENT (B).

EXPORTS OF PRINCIPAL ARTICLES from *Bombay* Presidency to Foreign External Ports, from January 1874 to March 1877, with the Average Prices of the Articles, the Value of Bar Silver in London, and the Rates of Exchange, and FREIGHT, current each Month at *Bombay*.

In the Month of	Rate of Exchange on London. Sight Bills.	* Value of China Gold Leaf per Tola in Bombay.	Value of Bar Silver in London, per oz.	Rate of Freight to Liverpool via Canal.	COTTON.		WOOL.		WHEAT.	LINSEED.		RAPESEED.		GINGELLY SEED.		MYRABOLLANS.		SILVER.
					Cwt.	Price per Cwt. exclusive of all Charges.	Cwt.	Price per Cwt. exclusive of all Charges.		Cwt.	Price per Cwt. exclusive of all Charges.	Cwt.	Price per Cwt. exclusive of all Charges.	Cwt.	Price per Cwt. exclusive of all Charges.	Cwt.	Price per Cwt. exclusive of all Charges.	
1874:																		
January	1 10 ³ / ₄	16 12	58 ¹ / ₂	2 16 ¹ / ₄	217,882	Rs. a. 26 5	12,881	Rs. a. 49 -	70,108	Rs. a. 4 9	42,326	Rs. a. 5 15 ¹ / ₂	6 8	21,047	Rs. a. 6 13 ¹ / ₂	7,838	Rs. a. 3 8 ¹ / ₂	1,94,350
February	1 11 ¹ / ₂	16 11 ³ / ₄	58 ³ / ₄	2 13 ¹ / ₄	351,229	24 9	15,064	45 4	126,480	4 5	166,137	5 14 ¹ / ₂	6 8	53,538	6 11 ¹ / ₂	23,856	3 7 ¹ / ₂	1,76,875
March	1 11 ¹ / ₂	16 12 ¹ / ₄	58	2 16 ¹ / ₄	654,027	25 2	13,081	45 1	50,982	4 2 ¹ / ₄	166,267	5 10 ¹ / ₂	6 6	56,039	6 12 ¹ / ₂	16,163	3 4 ¹ / ₂	5,22,650
April	1 11 ¹ / ₂	17 -	58 ¹ / ₂	2 18 ¹ / ₄	963,521	24 9 ¹ / ₂	15,724	45 8	22,495	4 2 ¹ / ₄	123,826	5 9 ¹ / ₂	6 2	341	6 13 ¹ / ₂	28,131	3 2 ¹ / ₂	18,000
May	1 11	17 -	58 ¹ / ₂	2 18 ¹ / ₄	871,549	25 6	18,375	45 8	86,345	4 5 ¹ / ₂	97,891	5 9 ¹ / ₂	5 6 ¹ / ₂	—	7 0 ¹ / ₂	12,740	3 6	90,320
June	1 10 ¹ / ₂	17 0 ¹ / ₂	58 ¹ / ₂	2 16 ¹ / ₄	544,099	25 2 ¹ / ₄	4,403	42 -	55,804	4 4	63,750	5 14 ¹ / ₂	5 7	1,254	6 13 ¹ / ₂	2,965	3 7 ¹ / ₂	2,79,040
July	1 10 ¹ / ₂	17 0 ¹ / ₂	58 ¹ / ₂	2 4 ¹ / ₂	217,708	24 15 ¹ / ₂	13,180	46 7	38,921	4 3 ¹ / ₂	81,363	5 14 ¹ / ₂	5 8 ¹ / ₂	750	6 15 ¹ / ₂	13,385	3 8	7,42,800
August	1 10 ¹ / ₂	17 2 ¹ / ₄	57 ¹ / ₂	2 0 ¹ / ₂	170,639	25 6 ¹ / ₂	13,180	46 7	83,918	4 3 ¹ / ₂	45,769	5 15 ¹ / ₂	5 9	1,819	6 12 ¹ / ₂	12,755	3 10 ¹ / ₂	2,69,975
September	1 10 ¹ / ₂	17 4	57 ¹ / ₂	1 19 ¹ / ₄	67,882	24 13 ¹ / ₂	12,084	41 4	58,320	4 2 ¹ / ₄	46,809	5 15 ¹ / ₂	5 9	18,850	6 10 ¹ / ₂	6,895	3 12 ¹ / ₂	3,45,400
October	1 10 ¹ / ₂	17 3 ¹ / ₄	57 ¹ / ₂	2 1 ¹ / ₄	64,305	25 1	9,100	49 8	47,824	4 2 ¹ / ₄	30,167	6 1 ¹ / ₂	5 6 ¹ / ₂	21,043	6 -	6,418	3 9 ¹ / ₂	5,04,200
November	1 10 ¹ / ₂	17 4	58	2 4 ¹ / ₂	100,002	24 5 ¹ / ₂	8,335	49 8	63,049	4 2 ¹ / ₄	30,167	6 1 ¹ / ₂	5 6 ¹ / ₂	59,941	5 11 ¹ / ₂	9,668	3 9	6,16,550
December	1 10 ¹ / ₂	17 3	57 ¹ / ₂	2 6 ¹ / ₂	162,148	22 9	11,486	45 12	63,049	4 2 ¹ / ₄	60,843	6 -	5 6 ¹ / ₂	—	—	—	—	6,09,550
1875:																		
January	1 10 ³ / ₄	17 3 ¹ / ₄	57 ¹ / ₂	2 8 ¹ / ₂	278,540	23 2 ¹ / ₄	8,774	42 14	48,788	3 12 ¹ / ₂	7,020	5 14 ¹ / ₂	4 14 ¹ / ₂	64,042	5 10 ¹ / ₂	12,088	3 9	4,11,952
February	1 10 ³ / ₄	17 4	57 ¹ / ₂	2 5 ¹ / ₂	490,655	24 13 ¹ / ₂	13,021	40 8	11,672	3 10 ¹ / ₂	80,998	5 15 ¹ / ₂	4 15	34,742	5 8	26,639	3 11	86,008
March	1 10 ³ / ₄	17 4 ¹ / ₂	57 ¹ / ₂	2 3	625,820	27 13 ¹ / ₂	8,932	39 -	30,182	3 10	137,966	5 7	4 15	42,555	5 9 ¹ / ₂	17,065	3 11	2,39,615
April	1 10 ³ / ₄	17 6 ¹ / ₂	57 ¹ / ₂	1 13 ¹ / ₄	865,094	26 13 ¹ / ₂	8,851	39 5	32,482	3 11 ¹ / ₂	131,139	5 9 ¹ / ₂	4 15	73,470	5 9 ¹ / ₂	28,750	4 3 ¹ / ₂	1,09,750
May	1 10 ³ / ₄	17 9 ¹ / ₂	56 ¹ / ₂	1 14 ¹ / ₂	910,159	27 13 ¹ / ₂	13,352	43 5 ¹ / ₂	67,953	3 14 ¹ / ₂	325,875	5 8	4 15	107,611	5 13 ¹ / ₂	12,600	4 3 ¹ / ₂	1,78,500
June	1 9 ¹ / ₂	17 10	55 ¹ / ₂	2 7 ¹ / ₂	614,781	25 5	12,645	44 12 ¹ / ₂	39,593	3 12 ¹ / ₂	174,305	5 6	5 6 ¹ / ₂	22,708	5 13 ¹ / ₂	6,400	4 4	1,95,860
July	1 9 ¹ / ₂	17 9 ¹ / ₂	55 ¹ / ₂	2 1	153,243	24 -	16,041	48 6	28,869	4 0 ¹ / ₂	75,768	5 7	5 6 ¹ / ₂	12,900	5 14 ¹ / ₂	2,527	4 3 ¹ / ₂	2,90,150
August	1 9 ¹ / ₂	17 7 ¹ / ₂	55 ¹ / ₂	2 3	66,455	23 6 ¹ / ₂	10,748	46 10 ¹ / ₂	138,862	4 7	39,999	5 10 ¹ / ₂	5 11	6,076	6 4	1,001	4 4	3,62,685
September	1 9 ¹ / ₂	17 6 ¹ / ₂	56 ¹ / ₂	2 6 ¹ / ₂	72,837	23 4	10,321	46 14 ¹ / ₂	113,559	4 1 ¹ / ₂	89,612	5 9 ¹ / ₂	5 11 ¹ / ₂	8,750	6 4	156	4 2 ¹ / ₂	3,54,110
October	1 9 ¹ / ₂	17 5 ¹ / ₂	56 ¹ / ₂	1 6 ¹ / ₂	47,200	23 -	10,858	46 10 ¹ / ₂	58,522	4 2 ¹ / ₄	14,820	5 9 ¹ / ₂	5 11	10,273	6 3 ¹ / ₂	1,148	4 1 ¹ / ₂	11,83,010
November	1 9 ¹ / ₂	18 8 ¹ / ₂	56 ¹ / ₂	1 14 ¹ / ₂	86,354	22 11 ¹ / ₂	9,916	45 2 ¹ / ₄	72,275	4 4 ¹ / ₂	108,573	5 10 ¹ / ₂	6 4	19,933	6 2 ¹ / ₂	7,550	3 13 ¹ / ₂	15,83,250
December	1 9 ¹ / ₂	17 9	56 ¹ / ₂	2 4 ¹ / ₂	138,295	22 8	12,002	40 15 ¹ / ₂	83,701	4 0 ¹ / ₂	236,874	5 10 ¹ / ₂	6 4	48,592	5 15 ¹ / ₂	19,136	4 -	8,61,750
1876:																		
January	1 9 ¹ / ₂	17 10 ¹ / ₂	55 ¹ / ₂	2 7 ¹ / ₂	220,019	22 0 ¹ / ₂	15,253	44 3	61,101	4 0 ¹ / ₂	189,173	5 4 ¹ / ₂	5 8 ¹ / ₂	111,066	6 -	26,259	3 14 ¹ / ₂	12,48,550
February	1 8 ¹ / ₂	18 0 ¹ / ₂	54 ¹ / ₂	1 17 ¹ / ₂	210,646	20 13 ¹ / ₂	10,216	45 7 ¹ / ₂	63,900	4 3	176,665	5 5 ¹ / ₂	5 8 ¹ / ₂	33,120	6 -	22,726	4 0 ¹ / ₂	13,23,300
March	1 8 ¹ / ₂	18 7	53 ¹ / ₂	2 0 ¹ / ₂	328,366	20 10 ¹ / ₂	13,433	47 6	71,152	4 3 ¹ / ₂	490,755	5 5 ¹ / ₂	5 13	58,255	6 3 ¹ / ₂	25,648	4 4	6,92,997
April	1 8 ¹ / ₂	18 4 ¹ / ₂	53 ¹ / ₂	2 1 ¹ / ₂	602,395	22 2 ¹ / ₂	15,043	45 3 ¹ / ₂	146,811	4 4 ¹ / ₂	429,177	5 2 ¹ / ₂	5 14 ¹ / ₂	46,344	6 11 ¹ / ₂	9,666	4 3 ¹ / ₂	8,32,350
May	1 8 ¹ / ₂	18 8 ¹ / ₂	52 ¹ / ₂	2 2 ¹ / ₂	803,509	22 1	15,389	45 8 ¹ / ₂	287,003	4 4 ¹ / ₂	523,877	5 3 ¹ / ₂	5 14 ¹ / ₂	11,653	6 11 ¹ / ₂	18,371	4 -	6,01,390
June	1 7 ¹ / ₂	19 0 ¹ / ₂	51 ¹ / ₂	2 5	646,780	22 2 ¹ / ₂	11,884	45 11 ¹ / ₂	104,719	4 7 ¹ / ₂	306,736	5 6 ¹ / ₂	6 2 ¹ / ₂	4,262	6 6 ¹ / ₂	11,015	3 14 ¹ / ₂	10,85,870
July	1 6 ¹ / ₂	19 13 ¹ / ₂	48 ¹ / ₂	2 11 ¹ / ₂	158,049	22 10 ¹ / ₂	15,495	47 13 ¹ / ₂	129,497	4 9	43,203	5 12 ¹ / ₂	6 4	6,077	6 7 ¹ / ₂	2,071	3 14 ¹ / ₂	17,04,250
August	1 7 ¹ / ₂	18 14 ¹ / ₂	52 ¹ / ₂	2 -	74,940	23 7 ¹ / ₂	7,804	48 9 ¹ / ₂	88,430	4 5 ¹ / ₂	189,537	5 11 ¹ / ₂	6 4	606	6 12 ¹ / ₂	6,116	3 14	21,29,561
September	1 7 ¹ / ₂	19 1	51 ¹ / ₂	1 12 ¹ / ₂	123,922	23 9 ¹ / ₂	11,906	47 8 ¹ / ₂	72,837	4 8 ¹ / ₂	170,185	5 11 ¹ / ₂	6 10	3,561	7 4	4,224	4 3 ¹ / ₂	38,38,054
October	1 8 ¹ / ₂	18 11 ¹ / ₂	52 ¹ / ₂	1 18	55,381	23 8	12,178	45 9 ¹ / ₂	139,043	4 10 ¹ / ₂	69,859	6 6 ¹ / ₂	6 15 ¹ / ₂	3,913	7 2 ¹ / ₂	1,012	4 3 ¹ / ₂	43,86,716
November	1 8 ¹ / ₂	18 5 ¹ / ₂	54 ¹ / ₂	2 2	132,826	25 8	10,985	46 14 ¹ / ₂	44,538	4 13	88,227	6 10 ¹ / ₂	8 0 ¹ / ₂	3,759	8 0 ¹ / ₂	10,897	4 5 ¹ / ₂	16,14,001
December	1 9 ¹ / ₂	17 14 ¹ / ₂	56 ¹ / ₂	2 4 ¹ / ₂	54,118	25 0	9,678	48 3	47,560	4 13 ¹ / ₂	74,295	6 6 ¹ / ₂	7 -	27,047	7 11 ¹ / ₂	12,475	4 7 ¹ / ₂	28,10,460
1877:																		
January	1 10	17 12 ¹ / ₄	57 ¹ / ₂	2 9 ¹ / ₂	153,025	26 14 ¹ / ₂	17,301	47 10	48,522	4 12 ¹ / ₂	50,500	6 3 ¹ / ₂	7 0 ¹ / ₂	35,614	7 12	21,865	4 10 ¹ / ₂	18,12,100
February	1 9 ¹ / ₂	17 14 ¹ / ₂	56 ¹ / ₂	2 5	854,795	26 5 ¹ / ₂	16,455	47 5 ¹ / ₂	79,899	4 10	60,666	6 4 ¹ / ₂	7 1 ¹ / ₂	15,742	7 12 ¹ / ₂	31,004	4 10 ¹ / ₂	2,76,068
March	1 9 ¹ / ₂	18 -	54 ¹ / ₂	2 2 ¹ / ₂	413,754	24 9 ¹ / ₂	10,958	45 8 ¹ / ₂	53,997	4 13	91,763	5 12 ¹ / ₂	6 10 ¹ / ₂	24,792	7 6 ¹ / ₂	22,221	4 10 ¹ / ₂	10,08,180

STATEMENT (C.)

STATEMENT showing the Value of the following ARTICLES imported into the Bombay Presidency from Foreign External Ports, from January 1874 to March 1877, with the Rate of Council Bills on *Bombay*, and the Value of Bar Silver in *London*.

In the Month of	Rate of Council Bills on Bombay.	Value of Bar Silver in London per oz.	Cotton Yarn.	Cotton Piece Goods.	Metals.	Sugar and Sugar Candy.	Raw Silk.	Silver.	Gold.
1874:	s. d.	d.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
January - -	1 10 $\frac{1}{8}$	58 $\frac{1}{16}$	5,85,945	49,85,420	5,34,499	7,49,055	5,76,907	4,43,766	12,00,420
February - -	1 10 $\frac{1}{16}$	58 $\frac{1}{8}$	6,79,163	52,70,157	6,62,210	10,39,065	7,42,018	88,42,608	14,04,982
March - -	1 10 $\frac{3}{4}$	58 $\frac{1}{8}$	7,64,690	60,99,569	9,80,732	5,62,536	4,19,253	93,48,133	8,78,927
April - -	1 10 $\frac{9}{16}$	58 $\frac{1}{16}$	3,80,179	15,33,965	3,79,011	2,09,982	3,02,646	82,94,832	26,30,745
May - -	1 10 $\frac{11}{16}$	58 $\frac{1}{16}$	6,09,629	28,97,252	7,64,588	2,31,434	3,41,626	66,45,198	14,21,795
June - -	1 10 $\frac{3}{8}$	58 $\frac{3}{4}$	6,83,702	34,03,347	7,41,837	2,27,001	2,01,115	14,76,318	8,27,454
July - -	1 10	58 $\frac{7}{16}$	6,93,989	34,19,471	9,86,326	12,480	5,04,554	7,34,008	8,22,388
August - -	1 9 $\frac{7}{8}$	58	7,19,003	32,31,326	8,24,525	10,408	8,62,512	1,87,378	5,73,970
September - -	1 10	57 $\frac{7}{8}$	6,62,398	24,01,376	3,56,371	67,302	7,12,402	14,53,390	7,15,357
October - -	1 10 $\frac{1}{16}$	57 $\frac{1}{16}$	8,81,588	49,64,173	5,71,682	7,37,573	16,82,595	17,98,401	5,03,897
November - -	1 10 $\frac{5}{16}$	58	5,73,468	34,12,191	5,68,908	5,43,635	4,73,599	3,53,003	9,00,125
December - -	1 10 $\frac{1}{16}$	57 $\frac{5}{8}$	6,11,721	37,44,157	7,46,948	5,04,759	5,08,720	4,95,689	3,66,569
1875:									
January - -	1 10 $\frac{5}{32}$	57 $\frac{1}{2}$	5,29,431	32,66,793	8,61,132	7,76,066	8,18,782	58,54,669	19,67,995
February - -	1 10 $\frac{1}{16}$	57 $\frac{1}{2}$	6,99,184	43,35,197	9,05,235	5,90,814	6,34,258	49,75,483	10,70,063
March - -	1 10	57 $\frac{3}{16}$	5,27,442	60,83,417	23,21,507	9,23,484	6,44,792	21,90,251	6,95,676
April - -	1 10	57 $\frac{1}{4}$	2,74,604	30,52,767	6,20,217	88,857	2,21,516	19,78,845	8,90,742
May - -	1 9 $\frac{1}{2}$	56 $\frac{3}{4}$	3,88,776	36,40,407	9,38,114	2,45,443	4,01,789	6,55,438	5,06,675
June - -	1 9 $\frac{3}{8}$	55 $\frac{3}{4}$	5,80,300	34,42,478	10,81,786	3,77,721	2,34,472	23,55,973	16,48,387
July - -	1 9 $\frac{3}{32}$	55 $\frac{3}{4}$	4,47,223	24,55,457	10,14,386	2,84,170	6,04,672	24,89,247	11,71,181
August - -	1 9 $\frac{3}{32}$	56 $\frac{3}{8}$	4,69,245	23,09,720	5,37,264	4,76,190	6,04,052	11,77,898	7,06,360
September - -	1 9 $\frac{3}{32}$	56 $\frac{3}{4}$	4,80,600	22,95,998	9,90,056	5,13,015	5,39,441	52,95,909	7,45,177
October - -	1 9 $\frac{2}{32}$	56 $\frac{7}{8}$	4,04,200	17,80,980	7,92,256	4,77,210	5,87,826	8,44,946	5,11,784
November - -	1 9 $\frac{5}{8}$	56 $\frac{1}{4}$	3,25,820	29,04,816	7,45,719	8,87,968	2,38,554	5,69,602	4,41,845
December - -	1 9 $\frac{7}{16}$	56 $\frac{1}{2}$	4,62,357	46,61,914	9,83,622	8,46,848	3,42,357	24,58,452	7,85,745
1876:									
January - -	1 9 $\frac{5}{16}$	55 $\frac{5}{8}$	3,46,053	50,45,034	13,22,755	16,55,258	9,72,464	11,06,022	8,24,824
February - -	- -	54 $\frac{3}{16}$	6,15,605	52,94,188	16,59,893	14,16,512	7,88,069	6,93,088	8,98,261
March - -	1 9	53 $\frac{3}{16}$	12,94,818	83,97,792	29,64,140	13,10,959	4,88,857	67,09,878	5,24,297
April - -	1 9 $\frac{7}{8}$	53 $\frac{1}{16}$	6,61,990	35,12,575	9,11,050	3,08,127	1,25,458	44,86,402	5,60,802
May - -	1 8 $\frac{9}{16}$	52 $\frac{1}{4}$	6,38,215	39,10,408	13,85,656	3,07,819	87,626	65,69,813	11,62,319
June - -	1 7 $\frac{3}{4}$	51 $\frac{1}{16}$	5,53,065	27,63,040	4,57,081	20,470	3,44,380	41,50,629	4,43,930
July - -	1 6 $\frac{1}{32}$	48 $\frac{3}{4}$	3,16,652	19,15,201	6,33,421	1,35,892	3,90,553	40,31,316	4,43,485
August - -	1 7 $\frac{1}{16}$	52 $\frac{1}{16}$	5,20,699	27,61,729	9,11,942	58,841	3,47,269	30,97,966	4,93,767
September - -	1 7 $\frac{3}{4}$	51 $\frac{1}{16}$	4,99,125	42,99,390	10,33,238	7,30,402	3,83,718	36,10,899	3,87,404
October - -	1 8 $\frac{3}{16}$	52 $\frac{9}{16}$	4,75,109	51,14,800	14,04,797	1,07,517	3,81,980	53,85,900	2,71,526
November - -	1 8 $\frac{1}{4}$	54 $\frac{9}{16}$	4,43,971	48,76,886	12,49,425	6,14,233	1,70,907	84,84,344	4,14,117
December - -	1 9 $\frac{2}{32}$	56 $\frac{1}{16}$	5,23,160	49,65,242	10,06,370	7,49,740	4,06,159	83,79,882	4,03,232
1877:									
January - -	1 10 $\frac{1}{16}$	57 $\frac{1}{2}$	4,33,171	44,26,988	10,39,753	2,51,963	4,22,348	89,64,526	6,98,107
February - -	1 9 $\frac{1}{4}$	56 $\frac{9}{16}$	7,82,618	49,88,758	13,73,787	2,42,322	4,95,523	1,13,95,546	30,56,801
March - -	1 9 $\frac{1}{32}$	54 $\frac{1}{16}$	8,03,020	50,20,765	18,92,897	2,29,039	1,64,663	39,63,069	21,05,300

STATEMENT (D.)

No. 1.

STATEMENT showing the Average PRICE each Month of LINSEED in *Bombay*, and in *London*, during the Years 1870-76, and the First Quarter of 1877, with the Current Rate of Exchange.

In the Month of	Price in Bombay per Cwt. (ungarbled), Exclusive of all Charges.	Rate of Exchange at Bombay on London. Sight Bills.	Price in London.		In the Month of	Price in Bombay per Cwt. (ungarbled), Exclusive of all Charges.	Rate of Exchange at Bombay on London. Sight Bills.	Price in London.	
			Per Quarter of 416 lbs.	Price per Cwt. at Rates of Exchange as per preceding Column.				Per Quarter of 416 lbs.	Price per Cwt. at Rates of Exchange as per preceding Column.
1870:	<i>Rs. a.</i>	<i>s. d.</i>	<i>s.</i>	<i>Rs. a. p.</i>	1874:	<i>Rs. a.</i>	<i>s. d.</i>	<i>s.</i>	<i>Rs. a. p.</i>
January -	6 4½	1 11 ⁹ / ₁₆	60¼	8 4 -	January -	5 15¾	1 10 ³ / ₄	64	9 1 2
February -	6 4	1 11 ⁹ / ₁₆	59¾	8 3 1	February -	5 14¾	1 11 ¹ / ₂	64½	9 - -
March -	6 6	1 11 ⁹ / ₁₆	60	8 3 7	March -	5 10	1 11¼	64¾	9 - -
April -	6 5¾	1 11 ⁵ / ₁₆	60¾	8 6 8	April -	5 9½	1 11	63	8 13 5
May -	6 7	1 10 ¹ / ₁₆	62¼	8 12 2	May -	5 9	1 11	61½	8 10 3
June -	6 6	1 10 ¹ / ₁₆	63¾	9 - 6	June -	5 9½	1 10½	60	8 9 11
July -	6 6½	1 10¾	64¼	9 1 11	July -	5 14½	1 10¼	60	8 11 6
August -	6 6½	1 10 ¹ / ₁₆	64½	9 6 10	August -	6 2	1 10¼	58½	9 7 11
September -	6 5½	1 10 ⁵ / ₁₆	62½	9 - 8	September -	5 15½	1 10 ³ / ₁₆	58	8 6 11
October -	6 4½	1 10¾	61½	8 13 7	October -	6 1½	1 10 ³ / ₁₆	57¾	8 6 5
November -	6 3½	1 11	60¾	8 8 5	November -	6 1	1 10¾	56¼	8 1 1
December -	6 1½	1 10 ⁷ / ₁₆	60	8 10 4	December -	6 -	1 10 ⁵ / ₁₆	57½	8 4 -
1871:					1875:				
January -	6 1½	1 10 ³ / ₁₆	60¼	8 12 3	January -	5 14½	1 10 ³ / ₁₆	60	8 11 11
February -	5 15½	1 10¾	61½	8 14 2	February -	5 15	1 10½	60¼	8 12 8
March -	6 1	1 10 ¹ / ₁₆	64	9 1 8	March -	5 7	1 10	58¾	8 10 2
April -	5 15¼	1 10 ¹ / ₁₆	64¼	9 4 -	April -	5 9¾	1 10 ¹ / ₁₆	59	8 10 2
May -	5 11¼	1 10¾	64½	9 3 7	May -	5 8½	1 10	56¾	8 5 3
June -	5 13½	1 10 ¹ / ₁₆	64¼	9 2 4	June -	5 6	1 9 ⁷ / ₁₆	51	7 10 9
July -	5 14	1 10¾	64	9 1 3	July -	5 7	1 9½	51	7 10 5
August -	5 11	1 10 ³ / ₁₆	63¼	8 15 5	August -	5 10	1 9 ¹ / ₁₆	51¾	7 11 5
September -	5 12¼	1 10 ³ / ₁₆	63¾	9 - 6	September -	5 9½	1 9¾	50½	7 8 -
October -	5 13¼	1 11 ¹ / ₁₆	64	8 15 3	October -	5 7	1 9 ³ / ₁₆	50¼	7 10 9
November -	5 15	1 11¼	64	8 14 1	November -	5 10¾	1 9½	53	7 14 6
December -	6 1½	1 11¾	64	8 13 4	December -	5 10¼	1 9½	54½	8 2 4
1872:					1876:				
January -	6 1	1 11½	63¾	8 11 8	January -	5 4¾	1 9½	52¼	7 15 10
February -	6 2½	1 11¼ ⁵ / ₁₆	63¾	8 9 10	February -	5 5¼	1 8 ⁹ / ₁₆	50	7 13 2
March -	6 6	1 11¾	63½	8 10 1	March -	5 5½	1 8¾	48¾	7 10 2
April -	6 4¼	1 11	63½	8 14 3	April -	5 2¾	1 8 ¹ / ₁₆	47¾	7 7 6
May -	6 5½	1 11 ³ / ₁₆	64½	8 15 7	May -	5 3¾	1 8 ⁵ / ₁₆	46¾	7 6 9
June -	6 4¾	1 10¾	65¼	8 14 9	June -	5 6½	1 7¾	48	7 13 9
July -	6 5	1 10 ⁷ / ₁₆	65	9 2 11	July -	5 12	1 6 ¹ / ₁₆	48½	8 4 4
August -	6 4½	1 10 ⁵ / ₁₆	62¾	8 13 7	August -	5 11½	1 7 ¹ / ₁₆	50	8 1 7
September -	6 5	1 10 ³ / ₁₆	64½	9 2 -	September -	6 -	1 7 ¹ / ₁₆	51	8 5 8
October -	6 5¾	1 10 ¹ / ₁₆	64¾	9 2 9	October -	6 6½	1 8 ¹ / ₁₆	54¾	8 13 2
November -	6 4	1 10¾	65	9 3 8	November -	6 10¾	1 8 ⁹ / ₁₆	56½	9 5 6
December -	6 1½	1 10 ¹ / ₁₆	65	9 4 1	December -	6 6¼	1 9¾	55¼	8 4 1
1873:					1877:				
January -	6 2	1 10 ¹ / ₁₆	65	9 4 1	January -	6 3¼	1 10	54¾	8 - 9
February -	6 1	1 10 ⁷ / ₁₆	59	8 5 3	February -	6 4¼	1 9 ¹ / ₁₆	52	7 11 3
March -	5 14½	1 10¾	63¼	8 15 -	March -	5 12½	1 9½	50¾	7 12 3
April -	5 10¾	1 10 ³ / ₁₆	63	8 14 7					
May -	5 12	1 10¾	65	9 3 8					
June -	5 14¼	1 10¾	64¼	9 2 8					
July -	5 14	1 10 ⁵ / ₁₆	63¼	9 2 7					
August -	5 12½	1 10 ⁷ / ₁₆	62¾	9 - 5					
September -	5 14½	1 10¾	63¾	9 2 8					
October -	6 -	1 10 ⁵ / ₁₆	64	9 4 1					
November -	5 15½	1 9¾	63¼	9 6 4					
December -	5 15	1 9 ¹ / ₁₆	63¾	9 7 3					

STATEMENT (D.)—continued.

No. 2.

STATEMENT showing the Average PRICE each Month of RAPESEED in *Bombay*, and in *London*, during the Years 1870-76, and the First Quarter of 1877, with the Current Rate of Exchange.

In the Month of	Price in Bombay per Cwt. (ungarbled), Exclusive of all Charges.	Rate of Exchange at Bombay on London. Sight Bills.	Price in London.		In the Month of	Price in Bombay per Cwt. (ungarbled), Exclusive of all Charges.	Rate of Exchange at Bombay on London. Sight Bills.	Price in London.	
			Per Quarter of 416 lbs.	Price per Cwt. at Rates of Exchange as per preceding Column.				Per Quarter of 416 lbs.	Price per Cwt. at Rates of Exchange as per preceding Column.
1870:	<i>Rs. a.</i>	<i>s. d.</i>	<i>s.</i>	<i>Rs. a. p.</i>	1874:	<i>Rs. a.</i>	<i>s. d.</i>	<i>s.</i>	<i>Rs. a. p.</i>
January -	6 5	1 11 ⁹ / ₁₆	61 ¹ / ₄	8 6 5	January -	6 8	1 10 ³ / ₄	51 ¹ / ₄	7 4 7
February -	6 5	1 11 ⁹ / ₁₆	61 ³ / ₄	8 7 6	February -	6 8	1 11 ³ / ₄	50 ³ / ₄	7 1 6
March -	6 5	1 11 ⁹ / ₁₆	63 ¹ / ₄	8 10 10	March -	6 6	1 11 ¹ / ₄	50 ¹ / ₄	6 15 10
April -	6 5	1 11 ⁹ / ₁₆	65	9 - 2	April -	6 2	1 11	48	6 11 10
May -	6 14 ³ / ₄	1 10 ¹ / ₁₆	67 ¹ / ₂	9 8 1	May -	5 6	1 11	46 ¹ / ₂	6 8 4
June -	7 1	1 10 ¹ / ₁₆	65	9 3 3	June -	5 6 ¹ / ₄	1 10 ¹ / ₄	47	6 11 9
July -	7 3	1 10 ¹ / ₁₆	65	9 3 8	July -	5 7	1 10 ¹ / ₄	46 ³ / ₄	6 12 8
August -	7 3	1 10 ¹ / ₁₆	62 ¹ / ₂	9 - 10	August -	5 8 ¹ / ₂	1 10 ¹ / ₄	43 ¹ / ₂	6 5 -
September -	7 3	1 10 ¹ / ₁₆	63 ¹ / ₂	9 3 1	September -	5 9	1 10 ³ / ₁₆	44 ¹ / ₄	6 7 1
October -	7 3	1 10 ³ / ₁₆	63 ¹ / ₂	9 2 8	October -	5 9	1 10 ³ / ₁₆	44 ¹ / ₂	6 7 5
November -	7 3	1 11	66	9 4 2	November -	5 6 ³ / ₄	1 10 ¹ / ₁₆	44 ¹ / ₂	6 5 8
December -	7 -	1 10 ⁷ / ₁₆	68 ¹ / ₄	9 13 3	December -	5 11 ¹ / ₄	1 10 ⁵ / ₁₆	44 ¹ / ₂	6 6 11
1871:					1875:				
January -	7 2	1 10 ³ / ₁₆	67 ¹ / ₄	9 12 7	January -	4 14 ¹ / ₄	1 10 ³ / ₁₆	47	6 13 7
February -	7 3	1 10 ³ / ₁₆	68	9 13 2	February -	4 15	1 10 ³ / ₁₆	46 ¹ / ₄	6 11 11
March -	7 3	1 10 ¹ / ₁₆	67 ³ / ₄	9 10 1	March -	4 15	1 10	45 ³ / ₄	7 4 2
April -	7 3	1 10 ⁷ / ₁₆	66 ¹ / ₂	9 8 11	April -	4 15	1 10 ¹ / ₁₆	46 ¹ / ₂	6 12 9
May -	7 -	1 10 ³ / ₁₆	65 ³ / ₄	9 6 11	May -	5 5	1 10	49 ¹ / ₄	7 3 8
June -	7 - ¹ / ₂	1 10 ¹ / ₁₆	65 ¹ / ₄	9 4 8	June -	5 5	1 9 ⁷ / ₁₆	52	7 13 5
July -	7 1	1 10 ³ / ₁₆	65	9 3 8	July -	5 6 ¹ / ₂	1 9 ¹ / ₁₆	50	7 8 2
August -	7 - ¹ / ₂	1 10 ³ / ₁₆	66	9 5 5	August -	5 11	1 9 ¹ / ₁₆	50 ¹ / ₄	7 7 8
September -	7 - ¹ / ₄	1 10 ¹ / ₁₆	67 ¹ / ₂	9 8 11	September -	5 11 ¹ / ₄	1 9 ³ / ₁₆	49	7 4 5
October -	7 1 ¹ / ₄	1 11 ¹ / ₁₆	69 ¹ / ₂	9 12 5	October -	5 11	1 9 ³ / ₁₆	48 ³ / ₄	7 6 11
November -	7 2 ¹ / ₂	1 11 ¹ / ₄	70	9 11 7	November -	6 4	1 9 ³ / ₁₆	53 ¹ / ₂	8 - -
December -	7 4 ¹ / ₂	1 11 ³ / ₈	68 ³ / ₄	9 7 11	December -	6 4	1 9 ³ / ₁₆	55	8 4 3
1872:					1876:				
January -	7 5	1 11 ³ / ₈	67 ¹ / ₂	9 3 8	January -	5 8 ¹ / ₄	1 9 ¹ / ₈	51	7 12 7
February -	7 5	1 11 ¹ / ₁₆	67 ¹ / ₂	9 1 9	February -	5 8 ¹ / ₄	1 8 ⁹ / ₁₆	49	7 11 2
March -	7 6	1 11 ¹ / ₄	65 ³ / ₄	8 15 -	March -	5 13	1 8 ⁸ / ₁₆	48 ³ / ₄	7 10 2
April -	7 9 ¹ / ₄	1 11	63 ¹ / ₄	8 14 3	April -	5 11	1 8 ¹ / ₁₆	49	7 10 5
May -	7 10	1 11 ³ / ₁₆	58	8 1 5	May -	5 14 ¹ / ₄	1 8 ⁵ / ₁₆	48 ¹ / ₂	7 10 5
June -	7 10	1 10 ³ / ₈	58 ³ / ₄	8 6 3	June -	6 2 ³ / ₄	1 7 ³ / ₄	50 ³ / ₄	8 4 10
July -	7 10	1 10 ⁷ / ₁₆	58 ¹ / ₄	8 3 7	July -	6 4	1 6 ¹ / ₁₆	49 ¹ / ₄	8 7 -
August -	7 10	1 10 ¹ / ₁₆	59	8 4 11	August -	6 4	1 7 ¹ / ₁₆	51	8 4 -
September -	7 10	1 10 ¹ / ₁₆	58	8 3 6	September -	6 10	1 7 ¹ / ₁₆	54 ¹ / ₄	8 14 4
October -	7 10	1 10 ¹ / ₁₆	59 ¹ / ₄	8 6 2	October -	6 15 ¹ / ₄	1 8 ¹ / ₁₆	55 ³ / ₄	8 15 7
November -	7 10	1 10 ³ / ₁₆	59 ¹ / ₄	8 6 6	November -	6 14 ³ / ₄	1 8 ⁹ / ₁₆	55 ¹ / ₄	8 10 11
December -	7 10	1 10 ¹ / ₁₆	61 ¹ / ₄	8 12 8	December -	7 -	1 9 ³ / ₈	58 ³ / ₄	8 12 5
1873:					1877:				
January -	7 9	1 10 ¹ / ₁₆	62	8 13 3	January -	7 - ¹ / ₂	1 10	58 ¹ / ₄	8 8 11
February -	7 6	1 10 ⁷ / ₁₆	60 ¹ / ₄	8 8 2	February -	7 1	1 9 ¹ / ₁₆	56 ¹ / ₄	8 5 10
March -	7 1 ¹ / ₄	1 10 ³ / ₁₆	57 ¹ / ₄	8 2 5	March -	6 10 ¹ / ₄	1 9 ³ / ₈	52 ³ / ₄	8 - 11
April -	6 8	1 10 ¹ / ₁₆	58	8 3 6					
May -	6 6 ¹ / ₂	1 10 ¹ / ₁₆	58	8 3 10					
June -	6 2 ¹ / ₂	1 10 ³ / ₁₆	58 ¹ / ₂	8 5 8					
July -	6 4 ¹ / ₂	1 10 ⁵ / ₁₆	57 ¹ / ₂	8 5 -					
August -	6 8	1 10 ⁷ / ₁₆	57	8 3 3					
September -	6 8	1 10 ³ / ₁₆	56 ³ / ₄	8 2 5					
October -	6 8	1 10 ⁵ / ₁₆	54 ¹ / ₄	7 14 11					
November -	6 8	1 9 ³ / ₁₆	52 ³ / ₄	7 13 3					
December -	6 8	1 9 ¹ / ₁₆	52	7 11 3					

STATEMENT (D.)—continued.

No. 3.

STATEMENT showing the Average PRICE each Month of FAIR DHOLLERA COTTON in *Bombay*, and in *Liverpool*, during the years 1858–60, 1874–76, and the first quarter of 1877, with the Current Rate of Exchange.

In the Month of	Price in Bombay per Cwt., Exclusive of all Charges.	Rate of Exchange at Bombay on London. Sight Bills.	Price in Liverpool.		In the Month of	Price in Bombay per Cwt., Exclusive of all Charges.	Rate of Exchange at Bombay on London. Sight Bills.	Price in Liverpool.	
			Per lb.	Price per Cwt. at Rates of Exchange as per preceding Column.				Per lb.	Price per Cwt. at Rates of Exchange as per preceding Column.
1858:	<i>Rs. a.</i>	<i>s. d.</i>	<i>d.</i>	<i>Rs. a. p.</i>	1875:	<i>Rs. a.</i>	<i>s. d.</i>	<i>d.</i>	<i>Rs. a. p.</i>
January -	17 2 $\frac{1}{4}$	1 11 $\frac{1}{2}$	4 $\frac{1}{16}$	23 8 6	January -	23 2 $\frac{1}{4}$	1 10 $\frac{3}{16}$	5 $\frac{1}{8}$	25 13 11
February -	17 8	2 - $\frac{1}{8}$	5 $\frac{1}{16}$	26 6 6	February -	24 13	1 10 $\frac{1}{8}$	5 $\frac{1}{4}$	26 6 3
March -	17 12 $\frac{1}{2}$	2 - $\frac{3}{8}$	5 $\frac{1}{8}$	24 2 -	March -	27 13 $\frac{1}{2}$	1 10	5 $\frac{1}{4}$	26 11 8
April -	21 13 $\frac{3}{4}$	2 - $\frac{5}{16}$	5 $\frac{3}{8}$	24 12 2	April -	27 13 $\frac{1}{2}$	1 10 $\frac{1}{16}$	5 $\frac{5}{16}$	26 15 6
May -	20 2 $\frac{1}{4}$	2 - $\frac{1}{2}$	5 $\frac{1}{2}$	25 2 3	May -	26 13 $\frac{3}{4}$	1 10	5 $\frac{1}{4}$	26 11 8
June -	21 5 $\frac{3}{4}$	2 -	5 $\frac{7}{16}$	25 10 8	June -	25 5	1 9 $\frac{7}{16}$	5 $\frac{1}{8}$	26 12 6
July -	21 11 $\frac{1}{2}$	1 11 $\frac{5}{16}$	5 $\frac{3}{4}$	27 10 -	July -	24 -	1 9 $\frac{1}{2}$	4 $\frac{5}{16}$	25 11 6
August -	22 -	1 11 $\frac{1}{4}$	5 $\frac{3}{8}$	27 1 7	August -	23 6 $\frac{1}{2}$	1 9 $\frac{1}{16}$	4 $\frac{7}{8}$	25 2 10
September -	22 -	1 11 $\frac{1}{2}$	5 $\frac{1}{4}$	27 6 6	September -	23 4	1 9 $\frac{3}{4}$	4 $\frac{3}{4}$	24 7 4
October -	21 6 $\frac{3}{4}$	1 11 $\frac{7}{8}$	5 $\frac{3}{4}$	26 15 7	October -	23 -	1 9 $\frac{3}{16}$	4 $\frac{3}{4}$	25 1 9
November -	22 8	1 11 $\frac{7}{8}$	5 $\frac{3}{4}$	26 15 7	November -	22 11 $\frac{1}{2}$	1 9 $\frac{5}{8}$	4 $\frac{3}{4}$	24 9 7
December -	21 9	2 - $\frac{1}{8}$	5 $\frac{3}{8}$	26 1 10	December -	22 8	1 9 $\frac{1}{2}$	4 $\frac{1}{16}$	24 6 8
1859:					1876:				
January -	20 11 $\frac{1}{2}$	2 - $\frac{3}{8}$	5 $\frac{1}{2}$	25 4 4	January -	22 - $\frac{1}{2}$	1 9 $\frac{1}{3}$	4 $\frac{5}{8}$	24 8 4
February -	17 8	2 - $\frac{3}{8}$	5 $\frac{1}{16}$	25 13 11	February -	20 12 $\frac{1}{2}$	1 8 $\frac{9}{16}$	4 $\frac{5}{16}$	23 7 10
March -	17 11 $\frac{1}{2}$	2 - $\frac{3}{8}$	5 $\frac{3}{8}$	26 9 4	March -	20 10 $\frac{1}{4}$	1 8 $\frac{5}{8}$	4 $\frac{3}{8}$	23 12 1
April -	21 4 $\frac{1}{2}$	2 - $\frac{3}{8}$	5 $\frac{3}{8}$	25 - 3	April -	22 2 $\frac{1}{2}$	1 8 $\frac{1}{16}$	4 $\frac{9}{16}$	24 11 3
May -	20 1	2 - $\frac{1}{16}$	5	22 7 4	May -	22 1	1 8 $\frac{5}{16}$	4 $\frac{3}{8}$	24 2
June -	19 12 $\frac{1}{2}$	2 - $\frac{1}{16}$	5 $\frac{1}{2}$	23 11 8	June -	22 2 $\frac{1}{4}$	1 7 $\frac{3}{4}$	4 $\frac{3}{8}$	24 13 -
July -	20 - $\frac{1}{2}$	1 11 $\frac{1}{16}$	5 $\frac{3}{4}$	27 - 8	July -	22 10 $\frac{1}{4}$	1 6 $\frac{5}{16}$	4 $\frac{3}{16}$	24 12 3
August -	20 4 $\frac{1}{2}$	1 11 $\frac{1}{16}$	5 $\frac{1}{4}$	24 11 1	August -	23 7 $\frac{1}{2}$	1 7 $\frac{1}{16}$	4 $\frac{7}{16}$	24 14 10
September -	20 12 $\frac{1}{2}$	2 - $\frac{3}{8}$	5	22 15 7	September -	23 9 $\frac{3}{4}$	1 7 $\frac{1}{16}$	4 $\frac{1}{2}$	25 9 7
October -	19 13 $\frac{3}{4}$	2 - $\frac{3}{8}$	5 $\frac{1}{16}$	23 4 2	October -	23 8	1 8 $\frac{1}{16}$	4 $\frac{7}{16}$	24 12 4
November -	19 -	2 - $\frac{1}{8}$	4 $\frac{3}{8}$	22 10 1	November -	25 -	1 8 $\frac{9}{16}$	4 $\frac{1}{16}$	26 3 5
December -	19 10 $\frac{1}{4}$	2 - $\frac{3}{8}$	4 $\frac{1}{16}$	21 8 7	December -	25 9	1 9 $\frac{5}{8}$	5 $\frac{1}{4}$	27 3 1
1860:					1877:				
January -	17 12 $\frac{1}{2}$	2 - $\frac{1}{4}$	4 $\frac{3}{4}$	21 15 -	January -	26 14 $\frac{1}{2}$	1 10	5 $\frac{1}{16}$	28 15 3
February -	16 -	2 - $\frac{3}{8}$	4 $\frac{3}{4}$	21 13 2	February -	26 5 $\frac{1}{4}$	1 9 $\frac{5}{8}$	5 $\frac{1}{2}$	28 3 10
March -	14 13 $\frac{3}{4}$	2 - $\frac{1}{2}$	4 $\frac{3}{4}$	20 6 2	March -	24 9 $\frac{1}{4}$	1 9 $\frac{1}{8}$	5 $\frac{3}{16}$	27 8 -
April -	14 12 $\frac{1}{2}$	2 - $\frac{1}{2}$	4 $\frac{3}{4}$	19 11 8					
May -	16 -	1 11 $\frac{1}{8}$	4 $\frac{3}{8}$	20 11 10					
June -	17 10 $\frac{1}{4}$	1 11 $\frac{1}{2}$	4	19 1 -					
July -	17 -	1 11 $\frac{3}{4}$	3 $\frac{3}{4}$	17 12 5					
August -	15 -	1 11 $\frac{9}{16}$	4	19 - 3					
September -	15 -	1 11 $\frac{3}{4}$	4 $\frac{3}{8}$	20 10 1					
October -	15 13 $\frac{3}{4}$	1 11 $\frac{5}{8}$	4 $\frac{3}{4}$	22 8 3					
November -	17 1	1 11 $\frac{7}{8}$	5	23 7 3					
December -	18 10 $\frac{1}{4}$	2 - $\frac{1}{8}$	5 $\frac{3}{4}$	26 6 9					
1874:									
January -	26 5	1 10 $\frac{3}{4}$	5 $\frac{5}{16}$	26 2 6					
February -	24 9	1 11 $\frac{1}{8}$	5 $\frac{5}{16}$	25 11 8					
March -	25 2	1 11 $\frac{1}{4}$	5 $\frac{9}{16}$	25 9 6					
April -	24 9 $\frac{3}{4}$	1 11	5 $\frac{9}{16}$	27 1 5					
May -	25 6 $\frac{1}{2}$	1 11	5 $\frac{9}{16}$	27 6 3					
June -	25 2 $\frac{1}{4}$	1 10 $\frac{1}{2}$	5 $\frac{3}{4}$	27 6 1					
July -	24 15 $\frac{1}{2}$	1 10 $\frac{1}{4}$	5 $\frac{5}{16}$	26 11 10					
August -	25 6 $\frac{1}{4}$	1 10 $\frac{1}{4}$	5 $\frac{5}{16}$	26 11 10					
September -	24 14 $\frac{1}{4}$	1 10 $\frac{3}{16}$	5 $\frac{3}{16}$	26 3 -					
October -	25 1	1 10 $\frac{3}{16}$	5 $\frac{1}{4}$	26 8 -					
November -	24 5 $\frac{3}{4}$	1 10 $\frac{1}{2}$	5 $\frac{1}{8}$	25 8 2					
December -	22 9	1 10 $\frac{5}{16}$	4 $\frac{1}{16}$	24 12 7					

No. 1.
AVERAGE PRICES CURRENT OF FOOD GRAINS, &c. at Bombay, from January 1874 to March 1877, with the Average Rate of EXCHANGE, and of the
VALUE OF GOLD LEAF.

BOMBAY.

In the Month of	Rate of Exchange on London, Sight Bills.	Value of Gold Leaf per Tola.	Wheat, per Rupee.	Barley, per Rupee.	Rice, Best Sort, per Rupee.	Rice, Common, per Rupee.	Jowar, per Rupee.	Bajra, per Rupee.	Gram, per Rupee.	Firewood, per Rupee.	Salt, per Rupee.	Wheat Flour, per Rupee.	Dall Toor, per Rupee.	Ghee, per Rupee.
1874:	s. d.	Rs. a.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.
January -	1 10 ³ / ₄	16 12	11 0	21 13	7 8	15 8	19 13	19 6	14 2 ¹ / ₂	68 6 ¹ / ₂	13 15	9 12	8 7 ¹ / ₂	1 4
February -	1 11 ¹ / ₄	16 11 ³ / ₄	12	19 1 ¹ / ₂	8 9 ¹ / ₂	16 1 ¹ / ₂	25 0	20 12 ¹ / ₂	17 9 ¹ / ₂	85 4 ¹ / ₂	14 1 ¹ / ₂	10 8	9 9 ¹ / ₂	1 6
March -	1 11 ¹ / ₄	16 12 ³ / ₄	13 3	17 9 ¹ / ₂	8 9 ¹ / ₂	15 8 ¹ / ₂	25 0	20 12 ¹ / ₂	16 12	81 14	14 1 ¹ / ₂	10 8	9 9 ¹ / ₂	1 6
April -	1 11	17 -	12 9	18 5	8 0 ¹ / ₂	13 14	21 3	18 8	14 4 ¹ / ₂	75 0	14 1 ¹ / ₂	10 8	9 9 ¹ / ₂	1 6
May -	1 11	17 -	12 2	17 8	7 11	13 8	21 3	17 1 ¹ / ₂	14 0	75 0	14 1 ¹ / ₂	10 8	9 4 ¹ / ₂	1 6
June -	1 10 ¹ / ₄	17 1	12 8	17 8	8 12 ¹ / ₂	14 11	21 3	18 0	15 1 ¹ / ₂	75 0	14 1 ¹ / ₂	10 8	9 4 ¹ / ₂	1 6
July -	1 10 ¹ / ₄	17 2 ¹ / ₄	12 8	17 8	8 12 ¹ / ₂	13 7	21 3	18 2	15 1 ¹ / ₂	75 0	14 1 ¹ / ₂	10 8	9 4 ¹ / ₂	1 6
August -	1 10 ¹ / ₄	17 2 ¹ / ₄	12 8	17 8	8 12 ¹ / ₂	13 7	21 3	18 2	15 1 ¹ / ₂	75 0	14 1 ¹ / ₂	10 8	9 4 ¹ / ₂	1 6
September -	1 10 ¹ / ₄	17 3 ³ / ₄	12 14	18 14	8 10 ¹ / ₂	12 9 ¹ / ₂	22 12 ¹ / ₂	18 0	14 9 ¹ / ₂	75 0 ¹ / ₂	14 1 ¹ / ₂	10 8	9 7	1 7 ¹ / ₂
October -	1 10 ¹ / ₄	17 4	12 10	20 4	8 12	12 4 ¹ / ₂	22 8	18 10 ¹ / ₂	14 8 ¹ / ₂	75 1	14 2	10 8	10 2 ¹ / ₂	1 8
November -	1 10 ¹ / ₄	17 4	--	--	--	--	--	--	--	--	--	--	--	--
December -	1 10 ¹ / ₄	17 3	--	--	--	--	--	--	--	--	--	--	--	--
1875:														
January -	1 10 ¹ / ₄	17 8 ¹ / ₂	13 4	20 6	7 9	11 13	24 3	20 12	13 13	68 4	14 2	6 7	10 1	1 6
February -	1 10 ¹ / ₄	17 4	11 7 ¹ / ₂	20 1 ¹ / ₂	7 8	11 11 ¹ / ₂	23 10 ¹ / ₂	20 3	17 2 ¹ / ₂	63 4	14 2	6 7	10 4	1 6
March -	1 10 ¹ / ₄	17 4 ¹ / ₂	10 6 ¹ / ₂	21 14 ¹ / ₂	7 5 ¹ / ₂	11 11 ¹ / ₂	20 5 ¹ / ₂	19 9	17 1 ¹ / ₂	68 4	14 2	6 7	11 6 ¹ / ₂	1 6
April -	1 10 ¹ / ₄	17 6 ¹ / ₂	11 1 ¹ / ₂	23 4	7 9 ¹ / ₂	11 15 ¹ / ₂	20 4	19 11 ¹ / ₂	16 14	68 4	14 2	6 7	12 1	1 6 ¹ / ₂
May -	1 10	17 9 ¹ / ₂	12 7 ¹ / ₂	20 0 ¹ / ₂	7 4	11 6	20 3	16 15 ¹ / ₂	18 2 ¹ / ₂	68 4	14 2	6 7	12 7 ¹ / ₂	1 3
June -	1 9 ¹ / ₂	17 10	12 12 ¹ / ₂	20 6	7 9 ¹ / ₂	11 2	20 4	16 15	18 6	68 4	14 2	6 7	12 15 ¹ / ₂	1 3
July -	1 9 ¹ / ₂	17 9 ¹ / ₂	11 9	20 4	7 12	11 2	20 4	17 3	18 10	68 4	14 2	6 7	12 15 ¹ / ₂	1 3
August -	1 9 ¹ / ₂	17 7 ¹ / ₂	11 9	20 4	7 12	11 2	20 4	17 3	18 10	68 4	14 2	6 7	12 15 ¹ / ₂	1 3
September -	1 9 ¹ / ₂	17 6 ¹ / ₂	12 2	18 9	7 10 ¹ / ₂	10 9 ¹ / ₂	19 6	17 3	18 10	68 4	14 2	6 7	12 15 ¹ / ₂	1 3
October -	1 9 ¹ / ₂	17 5 ¹ / ₂	11 10 ¹ / ₂	18 9	7 8	10 9 ¹ / ₂	19 8 ¹ / ₂	17 3	18 7 ¹ / ₂	68 4	14 2	6 7	12 15 ¹ / ₂	1 3
November -	1 9 ¹ / ₂	18 8 ¹ / ₂	12 5	18 9	8 2 ¹ / ₂	7 3	19 12	17 3	18 3 ¹ / ₂	68 4	14 2	6 7	12 15 ¹ / ₂	1 3
December -	1 9 ¹ / ₂	17 9	12 5	18 9	8 2 ¹ / ₂	7 3	20 14 ¹ / ₂	18 0	19 3	68 4	14 2	6 7	13 11 ¹ / ₂	1 3
1876:														
January -	1 9 ¹ / ₂	17 10 ¹ / ₂	12 15	18 9	8 7	11 14	21 6	17 1 ¹ / ₂	20 10	68 4	14 2	6 7	12 4	1 4
February -	1 8 ¹ / ₂	18 -	12 6 ¹ / ₂	18 0	8 7	11 13	20 7	17 0 ¹ / ₂	20 5 ¹ / ₂	68 4	14 2	6 7	11 7 ¹ / ₂	1 6
March -	1 8 ¹ / ₂	18 7	12 4	18 0	8 7	11 13	20 7	17 3	20 5	68 4	14 2	6 7	11 9	1 6
April -	1 8 ¹ / ₂	18 4 ¹ / ₂	12 4	18 0	8 7	11 13	20 0	17 1 ¹ / ₂	20 5	70 8	14 2	6 7	11 15 ¹ / ₂	1 6
May -	1 8 ¹ / ₂	18 8 ¹ / ₂	12 4	18 0	8 7	11 13	20 0	17 3	20 5	72 12	14 2	6 7	11 15 ¹ / ₂	1 6
June -	1 8 ¹ / ₂	19 8 ¹ / ₂	12 4	18 0	8 5 ¹ / ₂	11 8 ¹ / ₂	20 0	16 3 ¹ / ₂	20 1	68 4	14 2	6 7	11 9	1 5 ¹ / ₂
July -	1 6 ¹ / ₂	19 13 ¹ / ₂	11 12	18 0	7 12	10 7	20 0	15 4	19 0 ¹ / ₂	68 4	14 2	6 7	11 9	1 3
August -	1 7 ¹ / ₂	18 14 ¹ / ₂	11 6	18 0	7 12	11 2	20 0	15 4	18 10	68 4	14 2	6 7	11 9	1 3
September -	1 7 ¹ / ₂	19 1	11 9	18 0	7 12	11 2	20 0	15 4	18 10	68 4	14 2	6 7	10 14	1 3
October -	1 8 ¹ / ₂	18 11 ¹ / ₂	11 9	16 7	7 3	9 12 ¹ / ₂	16 10	11 12	12 12 ¹ / ₂	68 4	14 2	6 7	10 10 ¹ / ₂	1 3
November -	1 8 ¹ / ₂	18 5 ¹ / ₂	9 12	15 0	6 6	8 0	12 4	15 12 ¹ / ₂	12 10	68 4	14 2	5 13 ¹ / ₂	9 9 ¹ / ₂	1 3
December -	1 9 ¹ / ₂	17 14 ¹ / ₂	9 13 ¹ / ₂	16 0	6 11	9 1	12 11 ¹ / ₂	12 3	13 3	68 4	14 2	5 11	9 12	1 3
1877:														
January -	1 10	17 12 ¹ / ₂	9 12	16 0	6 14 ¹ / ₂	10 2 ¹ / ₂	13 12	12 13	13 0	68 4	14 2	6 3	9 14	1 3
February -	1 9 ¹ / ₂	17 14	9 12	16 0	6 15	10 7	13 12	12 14 ¹ / ₂	13 7	68 4	14 2	6 7	9 9	1 3
March -	1 9 ¹ / ₂	18 -	9 12	16 0	6 15	10 7	13 12	13 8 ¹ / ₂	13 13	68 4	14 2	6 7	9 6 ¹ / ₂	1 3 ¹ / ₂

80 tolas or 16 chittacks = 1 seer.

STATEMENT (E).—continued.

No. 2.

PRICES CURRENT OF FOOD GRAINS, &c. at Ahmedabad, from January 1874 to March 1877, with the Average Rate of EXCHANGE, and of the Value of GOLD LEAF.

AHMEDABAD.

In the Month of	Rate of Exchange in Bombay on London Sight Bills.	Value of China Gold Leaf, per Tola, in Bombay.	Wheat, per Rupee.	Barley, per Rupee.	Rice, Best Sort, per Rupee.	Rice, Common, per Rupee.	Jowar, per Rupee.	Bajra, per Rupee.	Gram, per Rupee.	Firewood, per Rupee.	Salt, per Rupee.	Wheat Flour, per Rupee.	Dall, Toor, per Rupee.	Ghee, per Rupee.
1874:	s. d.	Rs. a.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.
January	1 10 ³ / ₄	16 12	12 11	20 9 ¹ / ₂	6 5 ¹ / ₂	10 12	22 6	20 8	15 2	96 11	15 13	11 3	8 13	1 4
February	1 11 ¹ / ₄	16 11 ³ / ₄	14 8	24 8	6 8	11 0	24 8	23 0	17 8	100 0	18 0	12 8	11 0	1 6
March	1 11 ¹ / ₄	16 12 ³ / ₄	15 3	29 8	7 0	11 0	24 8	23 8	18 4	100 0	17 12	13 0	11 0	1 6
April	1 11	17 -	14 15	29 0	7 0	11 0	21 8	21 5	18 0	100 0	18 0	12 0	10 8	1 6
May	1 10 ¹ / ₄	17 1	13 11	29 0	7 0	11 0	20 0	20 11	18 0	100 0	18 0	12 0	10 0	1 8
June	1 10 ¹ / ₄	17 -	13 15	26 8	7 0	11 0	20 0	21 11	18 0	100 0	18 0	12 0	10 0	1 11
July	1 10 ¹ / ₄	17 2 ¹ / ₄	14 11	30 0	7 0	11 0	19 0	22 9 ¹ / ₂	18 0	100 0	18 0	12 8	10 0	1 11 ¹ / ₂
August	1 10 ³ / ₄	17 4	14 11 ¹ / ₂	30 0	7 0	11 0	19 0	23 12	18 8	100 0	18 0	13 0	11 0	1 12
September	1 10 ³ / ₄	17 3 ³ / ₄	15 8	30 0	7 0	11 0	24 0	19 0	19 8	100 0	18 0	13 0	11 0	1 12
October	1 10 ³ / ₄	17 4	16 0	35 0	7 0	11 0	19 0	25 4	19 8	100 0	18 0	13 0	11 0	1 12
November	1 10 ³ / ₄	17 3	16 12	36 0	8 0	12 0	23 2	25 3	17 14	100 0	18 0	12 0	12 0	1 12
December	1 10 ³ / ₄	17 3	16 12	36 0	8 0	12 0	23 2	25 3	17 14	100 0	18 0	12 0	12 0	1 12
1875:														
January	1 10 ³ / ₄	17 3 ¹ / ₄	16 0	32 0	8 0	13 0	29 8	24 12	16 8	100 0	18 0	12 0	15 0	1 13 ¹ / ₄
February	1 10 ³ / ₄	17 4	15 0	32 0	8 0	13 4	27 8	24 2	14 7	80 0	18 0	10 0	15 4	1 13
March	1 10 ³ / ₄	17 4 ¹ / ₄	17 12	32 0	8 0	13 6	24 12	23 13	18 4	80 0	18 0	11 8	15 0	1 13
April	1 10 ¹ / ₄	17 6 ³ / ₄	18 13	32 0	8 0	13 8	24 8	23 8	22 12	80 0	18 0	11 8	16 6	1 11
May	1 10 ¹ / ₄	17 9 ¹ / ₄	18 6 ¹ / ₄	32 0	8 0	12 2 ¹ / ₄	24 10	23 5 ¹ / ₂	22 5	80 0	18 0	11 13 ¹ / ₄	18 0	1 8 ¹ / ₄
June	1 9 ⁷ / ₈	17 10	17 13	30 8	7 4	11 5	22 15	20 14	22 2	80 0	18 0	11 9	17 12	1 5 ³ / ₄
July	1 9 ⁷ / ₈	17 9 ¹ / ₄	17 7	26 11	7 4	11 1	18 0	19 15	22 0	80 0	18 0	11 1	16 0	1 5
August	1 9 ¹ / ₄	17 7 ³ / ₄	16 10	26 1 ¹ / ₂	7 4	10 14	17 13 ¹ / ₄	18 6	21 10	80 0	18 0	11 0	16 0	1 5 ¹ / ₄
September	1 9 ¹ / ₄	17 6 ¹ / ₄	16 14	25 0	7 4	11 0	19 9	18 11 ¹ / ₄	20 10	80 0	18 0	11 0	16 0	1 5 ¹ / ₄
October	1 9 ¹ / ₄	17 5 ¹ / ₄	15 2	23 12	7 4	10 8	22 8	19 9	17 4	80 0	18 0	10 0	16 8	1 5 ¹ / ₄
November	1 9 ¹ / ₄	18 8 ³ / ₄	15 4	22 8	7 4	10 13 ¹ / ₄	23 12	24 1	17 8	80 0	18 0	10 0	17 4	1 6
December	1 9 ¹ / ₄	17 9	15 8	22 8	7 4	11 0	29 0	25 2	18 14	80 0	18 0	10 8	18 12	1 6
1876:														
January	1 9 ¹ / ₄	17 10 ¹ / ₄	15 8	22 8	7 4	11 0	25 8	23 7	18 14	80 0	18 0	11 0	19 0	1 6
February	1 8 ⁵ / ₈	18 -	15 8	24 0	7 4	11 0	25 0	23 0	20 12	80 0	18 0	10 8	19 0	1 6
March	1 8 ⁵ / ₈	18 7	16 12	25 0	7 4	11 0	25 0	23 0	23 8 ¹ / ₂	80 0	18 0	11 0	19 0	1 6
April	1 8 ¹ / ₄	18 4 ¹ / ₄	17 4	30 0	7 4	11 0	25 0	22 0	25 8	80 0	18 0	11 0	19 0	1 7
May	1 7 ⁵ / ₈	18 8 ¹ / ₄	17 4	28 0	7 4	11 2	23 15	21 12	25 8	80 0	18 0	11 0	19 0	1 5
June	1 6 ⁵ / ₈	19 -	16 10	25 0	6 15 ¹ / ₄	11 8	22 0	20 10	25 4	80 0	18 0	11 0	19 0	1 5
July	1 6 ⁵ / ₈	19 13 ¹ / ₄	16 2	25 0	6 12	11 8	20 0	18 8	23 10 ¹ / ₂	80 0	18 0	11 0	19 0	1 5
August	1 7 ¹ / ₂	18 14 ¹ / ₂	16 11	24 8 ¹ / ₄	6 12	10 9	20 0	18 4 ¹ / ₂	21 0 ¹ / ₂	80 0	17 14	10 8	19 2 ¹ / ₂	1 3
September	1 7 ¹ / ₂	19 1	16 5 ¹ / ₂	20 9	6 13	10 9	17 6 ¹ / ₂	19 6 ¹ / ₂	21 0 ¹ / ₂	80 0	17 12	10 11 ¹ / ₂	18 14	1 3
October	1 8 ⁵ / ₈	18 11 ¹ / ₄	16 1	25 12 ¹ / ₄	7 4	11 6	16 11 ¹ / ₄	17 14 ¹ / ₂	21 2	80 0	17 12	10 14 ¹ / ₂	16 11 ¹ / ₄	1 4
November	1 8 ⁵ / ₈	18 5 ¹ / ₄	14 2	24 2	7 12	10 8	17 11 ¹ / ₄	15 2	18 8	80 0	17 0	10 0	16 0	1 5
December	1 9 ¹ / ₄	17 14 ¹ / ₂	13 9	-	8 0	10 0	18 0	14 8	16 8	80 0	18 0	10 0	16 0	1 5
1877:														
January	1 10	17 12 ¹ / ₄	13 4	-	7 14	10 0	18 8	14 6	17 1	80 0	18 0	10 0	15 6	1 3
February	1 9 ³ / ₄	17 14	11 6	-	7 13	10 0	19 0	14 0	17 10	80 0	18 0	10 0	15 6	1 4
March	1 9 ³ / ₄	18 -	11 6	-	7 12	9 0	15 0	13 8	17 0	80 0	18 0	10 0	15 0	1 5

PAPERS RELATING TO SILVER.

KAIRA.

In the Month of	Rate of Exchange in Bombay on London, Sight Bills.	Value of China Gold Leaf, per Tola, in Bombay.	Wheat, per Rupee.	Barley, per Rupee.	Rice, Best Sort, per Rupee.	Rice, Common, per Rupee.	Jowar, per Rupee.	Bajra, per Rupee.	Gram, per Rupee.	Firewood, per Rupee.	Salt, per Rupee.	Wheat Flour, per Rupee.	Dall, Toor, per Rupee.	Ghee, per Rupee.
1874:														
January	1 10 ³ / ₄	Re. 16 12	10 9	-	7 4	11 10	22 1	19 14	14 14	99 8	15 14	9 9	11 6	1 6 ¹ / ₄
February	1 11 ¹ / ₄	16 11 ³ / ₄	13 14	-	9 0	12 14	26 8	23 8	16 2	98 14	17 3	13 8	12 14	1 6
March	1 11 ¹ / ₄	16 12 ³ / ₄	13 14	31 2	8 11	12 5	25 15	23 14	14 1	91 4 ¹ / ₂	16 9 ¹ / ₄	11 14	13 3	1 6
April	1 11	17 -	14 6	32 0	8 11	12 3	24 7	23 3	13 11	88 4	16 9 ¹ / ₄	12 9 ¹ / ₄	11 14	1 6
May	1 10 ¹ / ₂	17 -	13 7	32 0	8 11	12 9 ¹ / ₄	25 8	22 9 ¹ / ₄	14 4	85 10	16 6	11 14	12 6	1 8
June	1 10 ¹ / ₂	17 -	13 7	32 0	8 11	12 9 ¹ / ₄	25 8	22 9 ¹ / ₄	14 4	85 10	16 6	11 14	12 6	1 8
July	1 10 ¹ / ₂	17 2 ¹ / ₄	13 8	32 0	8 11	12 9 ¹ / ₄	23 0 ³ / ₄	22 9 ¹ / ₄	14 1 ¹ / ₄	91 5	16 4 ¹ / ₂	12 8	12 9 ¹ / ₄	1 9 ¹ / ₄
August	1 10 ¹ / ₂	17 4	13 8	32 0	8 11	12 9 ¹ / ₄	23 0 ³ / ₄	22 9 ¹ / ₄	14 6	91 4 ¹ / ₂	16 9 ¹ / ₄	12 8	12 4 ¹ / ₂	1 2 12 ¹ / ₂
September	1 10 ¹ / ₂	17 4	13 5	32 0	8 14	12 1	23 14	22 14	14 9	80 0	16 14	11 14	13 5	1 14
October	1 10 ¹ / ₂	17 3 ³ / ₄	13 5	32 0	8 14	12 4	27 13 ¹ / ₂	25 9 ¹ / ₄	14 9	80 0	16 13	11 14	14 4	1 14
November	1 10 ¹ / ₂	17 3	13 1	32 0	9 7	12 13	27 14	26 2 ¹ / ₄	15 10	80 0	16 13	11 10 ¹ / ₂	14 11 ¹ / ₂	2 1 ¹ / ₄
December	1 10 ¹ / ₂	17 3	13 1	32 0	10 5	13 10	32 0	25 1 ¹ / ₄	15 13 ¹ / ₂	106 11	16 13	11 10 ¹ / ₂	15 10	2 1 ¹ / ₄
1875:														
January	1 10 ³ / ₄	17 3 ¹ / ₄	12 7	32 0	9 11 ¹ / ₂	13 5	32 0	22 14	15 4	117 5 ¹ / ₂	17 1	11 2 ¹ / ₄	16 0	0
February	1 10 ³ / ₄	17 4	11 11	32 0	10 0	13 5	32 0	21 5	16 0	106 11	17 5	10 13 ¹ / ₄	16 0	0 ¹ / ₄
March	1 10	17 4 ³ / ₄	12 8	33 12 ¹ / ₂	10 0	13 5	32 0	20 0	17 4 ¹ / ₂	106 11	17 4 ¹ / ₂	11 9 ¹ / ₂	16 0	0 ¹ / ₄
April	1 10 ¹ / ₂	17 6 ³ / ₄	15 4	32 0	10 0	13 5	29 5 ¹ / ₂	20 15 ¹ / ₂	17 12	106 11	17 5	13 5	17 12	1 14 ¹ / ₂
May	1 10	17 9 ¹ / ₄	14 14 ¹ / ₂	32 0	9 7	11 13 ¹ / ₂	27 14	19 6 ¹ / ₂	17 12	106 11	17 1	12 9	20 0	1 11
June	1 9 ¹ / ₄	17 10	14 12	32 0	8 14	11 7	21 7	16 9 ¹ / ₂	17 12	80 0	16 13	12 5	20 0	1 6 ¹ / ₂
July	1 9 ¹ / ₄	17 9 ¹ / ₄	13 15	26 11	8 14	11 1	16 6 ¹ / ₂	16 10	17 6 ¹ / ₂	80 0	16 13	12 5	20 0	1 7
August	1 9 ¹ / ₄	17 7 ³ / ₄	14 4	26 11	8 14	11 14	16 6 ¹ / ₂	16 13	17 1	80 0	16 13	12 9	18 9	1 8
September	1 9 ¹ / ₄	17 6	13 10	26 11	8 10 ¹ / ₂	11 14	18 9	16 6 ¹ / ₂	14 2	80 0	16 13	12 1	20 0	1 8
October	1 9 ¹ / ₄	17 5 ¹ / ₄	13 5	26 11	8 10 ¹ / ₂	11 14	18 9	16 6 ¹ / ₂	12 6	80 0	16 13	11 14	28 10 ¹ / ₂	1 8 ¹ / ₂
November	1 9 ¹ / ₄	18 8 ¹ / ₄	12 6	21 7	8 14	11 14	27 7	21 11	13 15	80 0	16 13	11 1 ¹ / ₄	22 1 ¹ / ₂	1 10 ¹ / ₂
December	1 9 ¹ / ₄	17 9	11 7	22 14	10 0	13 5	22 0	22 14	15 4	93 5 ¹ / ₂	16 13	10 5	22 1 ¹ / ₂	1 11
1876:														
January	1 9 ¹ / ₄	17 10 ¹ / ₂	11 14	27 7	10 0	13 5	30 2 ¹ / ₂	20 0	16 14	106 11	17 12	10 14	22 1 ¹ / ₂	1 12
February	1 8 ¹ / ₄	18 -	11 10 ¹ / ₂	-	10 0	12 6	25 10	20 0	21 7	106 11	17 5	10 8	20 8	1 10 ¹ / ₂
March	1 8 ¹ / ₄	18 7	12 11	32 0	9 9	11 1	22 14	19 13 ¹ / ₂	22 14	106 11	17 5	11 5	24 12 ¹ / ₂	1 10 ¹ / ₂
April	1 8 ¹ / ₄	18 4 ¹ / ₂	14 14 ¹ / ₂	32 0	9 7	12 5	22 14	20 0	26 10 ¹ / ₂	106 11	17 5	13 5 ¹ / ₂	22 14	1 9 ¹ / ₄
May	1 8 ¹ / ₄	18 3 ¹ / ₄	15 4	30 8 ¹ / ₂	9 7	12 5	22 14	20 0	26 10 ¹ / ₂	106 11	17 5	13 4	22 14	1 6
June	1 7 ¹ / ₄	19 -	15 4	26 11	9 7	12 5	17 12	17 12	24 10	80 0	16 13	13 4	22 14	1 7
July	1 6 ¹ / ₄	19 13 ¹ / ₄	15 4	26 11	9 9	11 10	17 12	17 8 ¹ / ₂	24 10	80 0	16 13	13 4	21 11	1 6 ¹ / ₂
August	1 7 ¹ / ₄	18 14 ¹ / ₂	15 2	26 11	9 2	11 10	17 12	17 8 ¹ / ₂	24 10	80 0	16 13	13 2 ¹ / ₄	21 5	1 6
September	1 7 ¹ / ₄	19 1	15 4	23 11 ¹ / ₂	9 2	11 7	16 14	17 12	21 7	80 0	16 13	13 5	22 3	1 6 ¹ / ₂
October	1 8 ¹ / ₄	18 11 ¹ / ₂	15 4	22 14	9 2	11 7	16 14	17 12	21 7	80 0	16 13	13 5	22 3	1 6
November	1 8 ¹ / ₄	18 5 ¹ / ₄	12 9	20 1	8 0	10 0	17 12	15 4 ¹ / ₂	16 6 ¹ / ₂	80 0	17 5	11 4	16 -	1 5 ¹ / ₄
December	1 9 ¹ / ₄	17 14 ¹ / ₂	11 14	18 14	8 0	10 0	17 4 ¹ / ₂	14 9 ¹ / ₂	15 10	80 0	17 5	10 11 ¹ / ₂	14 9 ¹ / ₂	1 5 ¹ / ₄
1877:														
January	1 10	17 12 ¹ / ₂	11 7	20 0	8 0	10 0	16 13	13 15	15 4	80 0	17 5	10 5	13 15	1 4
February	1 9 ¹ / ₄	17 14	10 5 ¹ / ₄	20 0	8 0	10 0	16 0	13 10	16 14	80 0	17 5	9 6 ¹ / ₂	12 6	1 5
March	1 9 ¹ / ₄	18 -	11 14	20 0	8 0	10 0	16 0	13 10	16 6 ¹ / ₂	80 0	17	10 11	11 7	1

Statement E.—continued.

No. 4.

PRICES CURRENT OF FOOD GRAINS, &c. at Surat from January 1874 to March 1877, with the Average Rate of EXCHANGE and of the Value of GOLD LEAF.

SURAT.

In the Month of	Rate of Exchange on London in Bombay, Sight Bills.	Value of China Gold Leaf per Tola in Bombay.	Wheat per Rupee	Barley per Rupee	Rice, Best Sort, per Rupee.	Rice, Common, per Rupee.	Jowar per Rupee.	Bajra per Rupee.	Gram per Rupee.	Firewood per Rupee.	Salt per Rupee.	Wheat Flour per Rupee.	Dall, Toor, per Rupee.	Ghee per Rupee.
1874:														
January	s. d. 1 10 ³ / ₄	Rs. a. 16 12	s. ch. 12 0	s. ch. 6 14 ¹ / ₂	s. ch. 8 1 ¹ / ₂	s. ch. 13 9	s. ch. 15 9 ¹ / ₂	s. ch. 19 6	s. ch. 11 12 ¹ / ₂	s. ch. 87 0	s. ch. 11 9 ¹ / ₂	s. ch. 8 1 ¹ / ₂	s. ch. 7 14	s. ch. 1 0
February	1 11 ¹ / ₂	16 11 ¹ / ₂	—	—	—	—	—	—	—	—	—	—	—	—
March	1 11 ¹ / ₂	16 12 ¹ / ₂	14 12 ¹ / ₂	7 6	8 4	14 12 ¹ / ₂	18 10	18 8	12 13	111 0	11 4 ¹ / ₂	9 3	8 6	1 1 ¹ / ₂
April	1 11	17	14 1 ¹ / ₂	7 6	8 8	14 1 ¹ / ₂	16 14	17 7	13 6	111 0	12 4 ¹ / ₂	8 15	8 4 ¹ / ₂	1 0
May	1 11	17	13 6	7 6	7 15	12 4 ¹ / ₂	16 14	16 6	12 4 ¹ / ₂	111 9	12 4 ¹ / ₂	8 2	8 2	1 0 ³ / ₄
June	1 10 ¹ / ₂	17 1	13 6	7 6	8 1 ¹ / ₂	12 4 ¹ / ₂	16 6	16 8	12 0 ¹ / ₂	106 5	12 4 ¹ / ₂	8 2	8 0	1 1 ¹ / ₂
July	1 10 ¹ / ₂	17 2 ¹ / ₄	13 6	7 6	9 3	12 4 ¹ / ₂	18 8	18 8	12 4 ¹ / ₂	101 11	13 6	8 3	7 12 ¹ / ₂	1 2
August	1 10 ¹ / ₂	17 4	13 1 ¹ / ₂	7 6	9 0	11 4 ¹ / ₂	18 8	17 15	12 4 ¹ / ₂	101 11	13 6	8 3	8 3	1 3 ¹ / ₂
September	1 10 ¹ / ₂	17 3 ¹ / ₄	13 6	7 6	8 9 ¹ / ₂	11 5	17 15	17 15	12 6	101 12	13 6	8 3	8 3	1 4
October	1 10 ¹ / ₂	17 4	13 6	7 6	8 11	11 5	17 6	17 15	12 6	101 12	13 6	8 3	8 3	1 5
November	1 10 ¹ / ₂	17 3	13 11 ¹ / ₂	7 6	8 11	11 5	16 14	18 8	13 6	101 12	13 6	9 13	9 9	1 6
December	1 10 ¹ / ₂	17	13 11 ¹ / ₂	7 6	8 11	11 5	16 14	18 8	13 6	101 12	13 6	9 13	9 9	1 6
1875:														
January	1 10 ³ / ₄	17 3 ¹ / ₄	14 13	7 12 ¹ / ₂	9 4	11 5	16 1	19 13	13 6	101 12	13 6	10 9	9 14	1 5
February	1 10 ³ / ₄	17 4	14 7	8 11	8 11 ¹ / ₂	11 5	19 12	21 2	13 1 ¹ / ₂	101 12	13 6	11 7	9 14	1 5
March	1 10 ³ / ₄	17 4 ³ / ₄	14 1	8 11	8 8	10 15 ¹ / ₂	17 15	17 4 ³ / ₄	14 7	101 12	13 6	10 9	9 14	1 5
April	1 10 ¹ / ₂	17 6 ³ / ₄	13 11 ¹ / ₂	9 15	8 11	10 10	17 6	16 6	14 4 ¹ / ₂	101 12	13 6	10 10	10 5	1 5
May	1 10 ¹ / ₂	17 9 ¹ / ₂	12 13 ¹ / ₂	12 13 ¹ / ₂	8 3	10 10	17 15	16 14	14 13	101 12	13 6	10 10	11 7	1 7 ¹ / ₂
June	1 9 ¹ / ₂	17 10	12 13 ¹ / ₂	13 6	7 8 ¹ / ₂	9 9	17 8	15 9 ¹ / ₂	14 13	101 12	13 6	9 14	12 0	1 1
July	1 9 ¹ / ₂	17 9 ¹ / ₂	12 13	13 6	7 7	9 9	17 7	14 7	14 13	101 12	13 6	9 14	12 0	1 1
August	1 9 ¹ / ₂	17 7 ¹ / ₂	12 5	13 6	7 8 ¹ / ₂	8 7	16 6	14 1	14 1	92 8	14 13	9 14 ¹ / ₂	11 13 ¹ / ₂	0 15 ¹ / ₂
September	1 9 ¹ / ₂	17 6	12 5	13 6	7 6	8 3	16 4 ¹ / ₂	14 1	14 13	92 8	14 13	9 4	11 6	0 15 ¹ / ₂
October	1 9 ¹ / ₂	17 5 ¹ / ₂	12 5	13 6	7 6	8 3	16 4	14 7	14 13	92 8	14 13	9 4	11 6	1 1
November	1 9 ¹ / ₂	18 8 ¹ / ₂	12 5	13 6	7 10	8 7	16 6	15 9	12 5	92 8	14 13	9 4	12 9	1 4
December	1 9 ¹ / ₂	17 9	11 9 ¹ / ₂	13 6	7 14	11 9	16 14	16 6	13 6	92 8	14 13	9 12	13 1 ¹ / ₂	1 4
1876:														
January	1 9 ¹ / ₂	17 10 ¹ / ₂	12 5	13 6	7 6	12 9 ¹ / ₂	17 6	16 14	13 14	92 8	14 13	9 4	13 6	1 4
February	1 8 ¹ / ₂	18	11 14	14 1	7 7	11 14	16 14	16 1 ¹ / ₂	14 13	100 3	14 13	9 4	12 13 ¹ / ₂	1 2
March	1 8 ¹ / ₂	18 7	12 5	14 1	7 7	11 10 ¹ / ₂	16 14	16 1 ¹ / ₂	14 13	100 5 ¹ / ₂	14 13	9 4	12 5	1 2
April	1 8 ¹ / ₂	18 4 ¹ / ₂	13 6	14 1	7 10	10 9	16 6	14 13	14 13	100 8	14 13	9 4	12 5	1 1
May	1 8 ¹ / ₂	18 8 ¹ / ₂	13 2	14 1	8 0 ¹ / ₂	10 15 ¹ / ₂	16 6	14 13	14 13	100 8	14 13	9 4	12 5	0 15
June	1 7 ¹ / ₂	19	14 1	14 1	8 3	11 6	15 9 ¹ / ₂	14 13	14 13	96 8	14 13	9 13	12 5	0 15
July	1 7 ¹ / ₂	19 13 ¹ / ₂	13 11 ¹ / ₂	14 1	8 3	11 6	14 13	14 13	14 13	92 8	14 13	9 13	12 5	1 0
August	1 7 ¹ / ₂	18 13 ¹ / ₂	13 6	14 1	7 14	10 9	15 3 ¹ / ₂	14 13	14 13	92 8	14 13	9 13	12 5	0 15 ¹ / ₂
September	1 7 ¹ / ₂	19 1	12 13 ¹ / ₂	14 1	7 14	10 9	14 13	14 13	14 13	92 8	14 13	9 4	12 5	0 15 ¹ / ₂
October	1 8 ¹ / ₂	18 11 ¹ / ₂	12 5	14 1	7 10	10 9	15 1 ¹ / ₂	14 13	14 13	92 8	14 13	8 13	11 3	0 15 ¹ / ₂
November	1 8 ¹ / ₂	18 5 ¹ / ₂	9 9	13 6	6 11	7 13 ¹ / ₂	12 13 ¹ / ₂	13 3	15 15 ¹ / ₂	89 8	14 13	8 11	10 9	1 0
December	1 9 ¹ / ₂	17 14 ¹ / ₂	10 12 ¹ / ₂	13 6	6 11	7 9	10 8	10 12 ¹ / ₂	11 13 ¹ / ₂	86 8	14 7	7 6	9 14	0 15 ¹ / ₂
1877:														
January	1 10	17 12 ¹ / ₂	10 15 ¹ / ₂	13 6	6 11	7 9	11 10	11 7	12 5	86 8	14 13	7 8	8 5	0 15 ¹ / ₂
February	1 9 ¹ / ₂	17 14	11 6	13 6	6 13 ¹ / ₂	7 11 ¹ / ₂	12 13 ¹ / ₂	11 10 ¹ / ₂	12 13 ¹ / ₂	86 8	14 13	7 8	7 6	0 15
March	1 9 ¹ / ₂	18	11 13 ¹ / ₂	11 13 ¹ / ₂	7 0	8 0	12 12	12 12 ¹ / ₂	12 5	93 7	14 13	8 0	7 6	0 15

BROACH.

In the Month of	Date of Exchange on London in Bombay. Sight Bills.	Value of China Gold Leaf per Tola in Bombay.	Wheat per Rupee.	Barley per Rupee.	Rice, Best Sort, per Rupee.	Rice, Common, per Rupee.	Jowar per Rupee.	Bajra per Rupee.	Gram per Rupee.	Firewood per Rupee.	Salt per Rupee.	Wheat Flour per Rupee.	Dal, Toor, per Rupee.	Ghee per Rupee.
1874:	s. d.	Rs. a.	s. ch.	e. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.
January -	1 10 ³ / ₄	16 12	14 1 ¹ / ₂	13 14	8 12 ¹ / ₂	12 1 ¹ / ₂	20 0	18 9 ¹ / ₂	12 1 ¹ / ₂	97 4 ¹ / ₂	14 14	10 3	9 4 ¹ / ₂	0 14
February -	1 11 ¹ / ₂	16 11 ³ / ₄	16 0	15 0	9 8	13 0	20 0	20 0	13 0	120 0	16 0	11 0	9 8	1 3
March -	1 11 ¹ / ₂	16 12 ¹ / ₄	17 0	14 8	9 4	13 0	20 0	20 0	14 0	100 0	16 0	11 0	9 4	1 2 ¹ / ₂
April -	1 11	17 -	14 12	14 0	9 4	12 0	19 0	19 0	13 4	100 0	16 0	11 0	9 0	1 1
May -	1 11	17 -	14 12	14 0	9 8	12 0	19 8	19 8	13 8	100 0	16 0	10 8	9 0	1 2
June -	1 10 ¹ / ₂	17 1	14 0	14 0	9 8	12 0	20 0	19 8	13 12	100 0	16 0	10 8	9 0	1 2
July -	1 10 ¹ / ₂	17 2 ¹ / ₄	14 0	14 0	9 8	12 0	21 0	19 4	14 0	100 0	16 0	10 8	9 0	1 2
August -	1 10 ¹ / ₂	17 4	14 0	-	9 8	12 0	21 8	20 0	14 0	100 0	16 0	10 8	9 0	1 6
September -	1 10 ¹ / ₂	17 3 ¹ / ₄	14 0	-	9 4	12 0	21 0	19 0	15 0	90 0	16 0	10 8	9 0	1 8
October -	1 10 ¹ / ₂	17 4	14 0	-	9 4	12 0	22 0	19 0	13 4	100 0	16 0	10 8	10 0	1 8
November -	1 10 ¹ / ₂	17 3	14 0	-	9 12	12 0	19 12	18 12	15 0	100 0	16 0	10 8	11 4	1 8
December -	1 10 ¹ / ₂	17 3	14 0	-	9 12	12 0	19 12	18 12	15 0	100 0	16 0	10 8	11 4	1 8
1875:														
January -	1 10 ¹ / ₂	17 3 ¹ / ₄	14 0	-	9 4	12 8	19 8	18 4	15 0	106 0	16 8	10 4	11 12	1 8
February -	1 10 ¹ / ₂	17 4	14 0	16 0	9 0	13 0	19 0	18 0	15 0	100 0	17 0	11 0	13 0	1 6
March -	1 10	17 4 ³ / ₄	14 0	16 0	9 0	12 0	19 0	18 0	15 0	100 0	17 0	11 0	13 0	1 6
April -	1 10 ¹ / ₂	17 6 ³ / ₄	16 0	16 0	9 4	12 0	20 0	16 12	15 8	100 0	16 0	11 0	13 0	1 5
May -	1 10	17 9 ¹ / ₄	14 8	-	10 0	11 8	20 0	16 0	14 8	100 0	16 0	11 0	14 4	1 1
June -	1 9 ¹ / ₂	17 10	13 4	-	8 0	10 12	19 0	16 0	16 0	100 0	16 0	11 0	15 0	1 0
July -	1 9 ¹ / ₂	17 9 ¹ / ₄	13 0	-	8 0	10 0	18 0	16 0	16 0	100 0	16 0	11 0	16 0	1 0
August -	1 9 ¹ / ₂	17 7 ¹ / ₄	13 8	-	8 0	10 8	18 0	16 0	17 0	100 0	16 0	11 0	15 8	1 1
September -	1 9 ¹ / ₂	17 6	14 0	-	8 0	11 0	18 0	15 0	18 0	100 0	16 0	11 0	15 0	1 1
October -	1 9 ¹ / ₂	17 5 ¹ / ₄	14 0	-	8 0	11 0	18 0	15 8	18 0	100 0	16 0	11 0	15 0	1 1
November -	1 9 ¹ / ₂	18 8 ³ / ₄	14 0	-	8 7	11 3 ¹ / ₂	17 15	16 0	18 0	100 5	16 0	11 3 ¹ / ₂	15 8	1 1
December -	1 9 ¹ / ₂	17 9	14 4	-	8 15	11 11 ¹ / ₂	17 7	16 0	19 8	100 5	16 0	11 0	16 0	1 4
1876:														
January -	1 9 ¹ / ₂	17 10 ¹ / ₂	13 2 ¹ / ₂	-	8	10 11 ¹ / ₂	16 6	16 0	16 0	100 0	16 0	10 8	16 0	1 4
February -	1 8 ⁹ / ₂	18 -	13 0	-	8 2 ¹ / ₂	10 0	18 6 ¹ / ₂	16 0	16 6 ¹ / ₂	106 0	16 0	10 0	16 0	1 4
March -	1 8 ⁹ / ₂	18 7	13 14 ¹ / ₂	-	8 3 ¹ / ₂	11 13 ¹ / ₂	17 12	16 0	17 4 ¹ / ₂	106 0	16 0	11 6 ¹ / ₂	16 0	1 4
April -	1 8 ¹⁵ / ₂	18 4 ¹ / ₂	15 4	-	8 0	11 13 ¹ / ₂	18 7	16 0	18 13	106 0	16 0	11 11	16 0	1 1
May -	1 8 ¹⁵ / ₂	18 8 ³ / ₄	16 0	-	8 7	11 6 ¹ / ₂	18 4 ¹ / ₂	16 0	17 12	106 0	16 0	12 0	16 0	1 0 ¹ / ₂
June -	1 7 ¹⁵ / ₂	19 -	15 10	-	8 3	11 6 ¹ / ₂	17 13	16 0	18 13	106 0	16 0	12 0	16 0	1 0 ¹ / ₂
July -	1 6 ¹⁵ / ₂	19 13 ¹ / ₄	15 3 ³ / ₄	-	8 3	11 6 ¹ / ₂	16 13 ¹ / ₄	16 0	18 13	106 0	16 0	11 0	14 10 ¹ / ₂	1 0
August -	1 7 ¹⁵ / ₂	18 14 ¹ / ₂	15 3 ³ / ₄	-	8 6	11 6 ¹ / ₂	16 13 ¹ / ₄	15 8	18 13	106 0	16 0	12 0	13 10 ¹ / ₂	1 0
September -	1 7 ¹⁵ / ₂	19 1	14 8	-	8 14	11 6 ¹ / ₂	15 9 ¹ / ₂	15 10	18 14 ¹ / ₂	106 0	16 0	11 0	13 14 ¹ / ₂	1 0
October -	1 8 ⁹ / ₂	18 11 ¹ / ₂	13 10	-	8 7	11 6 ¹ / ₂	13 4 ¹ / ₂	14 8 ¹ / ₂	15 8 ¹ / ₂	106 0	16 14	11 0	13 5	1 1
November -	1 8 ⁹ / ₂	18 5 ¹ / ₂	12 1 ¹ / ₂	-	8 0	10 0	12 8 ¹ / ₂	12 12	11 6 ¹ / ₂	106 0	16 14	10 5	11 0 ¹ / ₂	1 1
December -	1 9 ⁹ / ₂	17 14 ¹ / ₂	13 5	-	8 0	11 6 ³ / ₄	13 5	13 5	13 5	106 0	16 0	10 8 ¹ / ₂	11 6 ³ / ₄	1 1 ¹ / ₂
1877:														
January -	1 10	17 12 ¹ / ₂	12 9	-	8 6 ¹ / ₂	11 7	13 14 ¹ / ₂	13 5 ¹ / ₂	13 5 ¹ / ₂	106 0	16 0	10 0	11 6 ¹ / ₂	1 0 ¹ / ₂
February -	1 9 ¹⁵ / ₂	17 14	12 5	-	8 0	10 5 ¹ / ₂	15 4 ¹ / ₂	13 5 ¹ / ₂	13 5 ¹ / ₂	106 0	16 0	10 0	8 11 ¹ / ₂	1 1
March -	1 9 ¹⁵ / ₂	18 -	13 10	-	8 0	10 0	16 0	13 14 ¹ / ₂	13 14 ¹ / ₂	106 0	16 0	10 0	8 14	1 0 ¹ / ₂

Statement E.—continued.

No. 6.

PRICES CURRENT OF FOOD GRAINS, &c. at *Tanna*, from January 1874 to March 1877, with the Average Rate of EXCHANGE and of the Value of GOLD LEAF.

T A N N A.

In the Month of	Rate of Exchange on London in Bombay. Sight Bills.	Value of China Gold Leaf per Tola in Bombay.	Wheat per Rupee.	Barley per Rupee.	Rice, Best Sort, per Rupee.	Rice, Common, per Rupee.	Jowar per Rupee.	Bejra per Rupee.	Gram per Rupee.	Firewood per Rupee.	Salt per Rupee.	Wheat Flour per Rupee.	Dall, Toor, per Rupee.	Ghee per Rupee.
	<i>s. d.</i>	<i>Rs. a.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>
1874:														
January -	1 10 ¹ / ₂	16 12	11 3	13 8	7 6	11 3	15 14	16 5	12 5 ¹ / ₂	66 8	14 0	8 6	7 0	1 6
February -	1 11 ¹ / ₂	16 11 ¹ / ₂	12 0	17 0	8 8	12 0	18 1 ¹ / ₂	18 1 ¹ / ₂	14 1 ¹ / ₂	80 0	15 0	9 0	9 0	1 3
March -	1 11 ¹ / ₂	16 12 ¹ / ₂	12 8	16 9 ¹ / ₂	8 12	12 8	17 9 ¹ / ₂	17 13	14 1 ¹ / ₂	75 9	15 8	9 0	8 4	1 3
April -	1 11	17 - ¹ / ₂	12 0	15 8	7 12	11 0	16 8	15 8	13 8	71 1 ¹ / ₂	15 0	9 0	8 0	1 1 ¹ / ₂
May -	1 10 ¹ / ₂	17 1	11 4	15 0	7 12	11 4	16 0	16 8	12 8	61 0	15 0	9 0	7 8	1 0
June -	1 10 ¹ / ₂	17 1	11 4	15 0	7 12	11 4	16 0	16 8	12 8	61 0	15 0	9 0	7 8	1 0
July -	1 10 ¹ / ₂	17 1	11 4	15 0	7 12	11 4	16 0	16 8	12 8	61 0	15 0	9 0	7 8	1 0
August -	1 10 ¹ / ₂	17 2 ¹ / ₂	10 0	14 0	8 0	10 0	16 0	16 0	12 8	61 0	15 0	9 0	7 12	1 1 ¹ / ₂
September -	1 10 ³ / ₈	17 4	10 0	13 0	8 0	10 0	17 0	17 0	12 8	64 0	15 0	9 0	8 0	1 4
October -	1 10 ³ / ₈	17 3 ¹ / ₂	9 8	12 8	7 12	9 8	17 8	17 8	13 0	64 0	15 0	9 0	8 0	1 4
November -	1 10 ³ / ₈	17 4	10 8	12 0	7 12	10 8	18 0	17 0	13 8	67 0	15 0	9 0	8 0	1 4
December -	1 10 ³ / ₈	17 3	12 8	12 0	8 12	12 8	18 0	17 0	14 8	70 0	15 0	9 8	8 4	1 6
1875:														
January -	1 10 ³ / ₈	17 3 ¹ / ₂	12 0	12 0	8 12	12 4	19 0	18 12	15 8	70 0	14 0	9 0	9 0	1 7
February -	1 10 ³ / ₈	17 4	11 0	12 0	9 0	11 0	18 0	18 0	16 0	80 0	14 0	9 0	9 0	1 6
March -	1 10 ³ / ₈	17 4 ¹ / ₂	11 0	12 0	7 12	11 0	18 0	19 8	15 0	80 0	14 0	9 0	12	1 6
April -	1 10 ¹ / ₂	17 6 ¹ / ₂	10 0	16 0	8 0	10 0	18 0	18 0	16 0	80 0	14 0	9 0	9 0	1 4
May -	1 10	17 9 ¹ / ₂	11 0	16 0	8 0	11 0	17 0	16 8	15 0	70 0	14 0	9 0	10 0	1 2
June -	1 9 ⁷ / ₈	17 10	10 0	16 0	7 0	10 0	16 0	16 0	15 0	64 0	14 0	9 0	9 12	1 2
July -	1 9 ⁷ / ₈	17 9 ³ / ₄	11 0	15 0	7 8	10 0	16 0	16 0	15 0	64 0	14 0	9 0	9 0	1 0
August -	1 9 ¹ / ₂	17 7 ¹ / ₂	11 0	15 0	7 8	10 0	16 0	16 0	15 0	64 0	14 0	9 0	9 0	1 0
September -	1 9 ¹ / ₂	17 6	11 0	15 0	7 8	10 0	16 0	16 0	15 0	64 0	14 0	9 0	9 0	1 0
October -	1 9 ¹ / ₂	17 5 ¹ / ₂	11 0	15 0	7 0	10 0	17 0	16 0	15 0	64 0	14 0	9 0	9 0	1 0
November -	1 9 ¹ / ₂	18 8 ¹ / ₂	11 0	15 0	7 0	10 0	17 0	16 0	15 0	64 0	14 0	9 0	9 0	1 2
December -	1 9 ¹ / ₂	17 9	11 8	15 0	7 0	10 0	17 0	16 8	16 0	67 8	14 0	8 0	9 8	1 3
1876:														
January -	9 ¹ / ₂	17 10 ¹ / ₂	12 0	15 0	9 0	12 0	17 0	16 0	18 0	71 0	14 0	9 0	10 0	1 4
February -	1 8 ¹ / ₂	18 - ¹ / ₂	12 0	15 0	9 0	12 0	16 8	16 0	18 0	80 0	14 0	9 0	10 0	1 6
March -	1 8 ¹ / ₂	18 7	12 0	15 0	9 0	11 0	17 0	16 0	18 0	80 0	14 0	9 0	10 0	1 6
April -	1 8 ¹ / ₂	18 4 ¹ / ₂	12 0	15 0	8 0	11 0	17 0	16 0	18 0	80 0	14 0	9 0	10 6	1 6
May -	1 8 ¹ / ₂	18 8 ¹ / ₂	12 0	15 0	8 0	11 0	17 0	16 0	18 0	80 0	14 0	9 0	10 6	1 6
June -	1 7 ¹ / ₂	19 - ¹ / ₂	11 7 ¹ / ₂	13 6	7 12	10 3	16 15	15 8	17 0	82 0	13 10 ¹ / ₂	9 0	10 3	1 6
July -	1 6 ¹ / ₂	19 13 ¹ / ₂	11 5 ¹ / ₂	11 12	7 8	10 9	17 14	14 0	17 8	80 0	14 0	9 0	11 0	1 3
August -	1 7 ¹ / ₂	19 14 ¹ / ₂	11 12	11 12	7 8	10 9	17 14	14 0	17 8	80 0	14 0	9 0	11 0	1 0
September -	1 7 ¹ / ₂	19 1	11 11	11 12	7 8	10 9	17 14	14 0	17 8	80 0	14 0	9 0	11 0	1 0
October -	1 8 ¹ / ₂	19 11 ¹ / ₂	9 14	11 12	6 15	8 3	16 3	9 4	17 8	80 0	14 0	9 0	11 0	1 0
November -	1 8 ¹ / ₂	18 5 ¹ / ₂	9 10	12 1	6 15	8 12 ¹ / ₂	14 14	9 14 ¹ / ₂	12 8	80 0	14 0	7 4	9 13	1 0
December -	1 8 ¹ / ₂	17 14 ¹ / ₂	9 6	12 6	6 15	9 6	13 9	10 9	12 8	80 0	14 0	7 4	8 14	1 0
1877:														
January -	1 10	17 12 ¹ / ₂	9 6	12 6	6 15	9 6	13 9	10 9	12 8	80 0	14 0	7 4	8 14	1 0
February -	1 9 ¹ / ₂	17 14	9 6	12 6	8 9	9 13	11 6	10 9	10 15	80 0	14 0	7 4	8 14	1 0
March -	1 9 ¹ / ₂	18 -	9 6	12 6	8 1 ¹ / ₂	9 15 ¹ / ₂	11 1 ¹ / ₂	10 9	10 15	80 0	14 0	7 4	8 14	1 0

KOLABA (ALIBAGH).

In the Month of	Rate of Exchange on London in Bombay. Sight Bills.	Value of China Gold Leaf in Bombay.	Wheat per Rupee.	Barley per Rupee.	Rice, Best Sort, per Rupee.	Rice, Common, per Rupee.	Jowar per Rupee.	Bajra per Rupee.	Gram per Rupee.	Firewood per Rupee.	Salt per Rupee.	Wheat Flour per Rupee.	Dall, Toor, per Rupee.	Ghee per Rupee.
1874:	s. d.	Rs. a.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.
January -	1 10 ¹ / ₂	16 12	10 5	-	7 3	13 1 ¹ / ₂	-	-	10 7	106 8	13 4 ¹ / ₂	10 0	6 14	1 6
February -	1 11 ¹ / ₂	16 11 ¹ / ₂	-	-	7 6	13 3	-	-	13 11	140 0	14 3	9 0	8 10	1 4 ¹ / ₂
March -	1 11 ¹ / ₂	16 12 ¹ / ₂	11 4 ¹ / ₂	-	7 6	13 3	-	-	14 3	140 0	14 3	8 0	9 14	1 4 ¹ / ₂
April -	1 11	17 -	11 4 ¹ / ₂	-	7 6	13 3	-	-	14 3	140 0	14 3	8 0	9 14	1 3
May -	1 11	17 -	11 4 ¹ / ₂	-	7 6	12 1 ¹ / ₂	-	14 3	14 3	140 0	14 3	8 0	9 14	1 3
June -	1 10 ¹ / ₂	17 1	11 4 ¹ / ₂	-	7 8	11 4 ¹ / ₂	-	-	13 3	140 0	13 3	8 0	9 14	1 3
July -	1 10 ¹ / ₂	17 1	-	-	-	-	-	-	-	-	-	-	-	-
August -	1 10 ¹ / ₂	17 2 ¹ / ₂	-	-	-	-	-	-	-	-	-	-	-	-
September -	1 10 ¹ / ₂	17 4	-	-	-	-	-	-	-	-	-	-	-	-
October -	1 10 ¹ / ₂	17 8 ¹ / ₂	-	-	-	-	-	-	-	-	-	-	-	-
November -	1 10 ¹ / ₂	17 4	-	-	-	-	-	-	-	-	-	-	-	-
December -	1 10 ¹ / ₂	17 3	-	-	-	-	-	-	-	-	-	-	-	-
1875:														
January -	1 10 ¹ / ₂	17 3 ¹ / ₂	11 6	-	7 9	11 6	-	18 4	13 10	112 0	15 3	8 0	7 2	1 2
February -	1 10 ¹ / ₂	17 4	11 6 ¹ / ₂	-	7 9 ¹ / ₂	11 5	-	20 8 ¹ / ₂	14 6 ¹ / ₂	112 0	15 3	8 0	7 2	1 2
March -	1 10 ¹ / ₂	17 4 ¹ / ₂	12 6 ¹ / ₂	-	7 10	13 11 ¹ / ₂	-	20 14 ¹ / ₂	16 11	125 0	16 11	9 0	7 7 ¹ / ₂	1 2
April -	1 10 ¹ / ₂	17 6 ¹ / ₂	13 5	-	7 10	13 5	-	19 0	17 9	130 0	18 3	9 0	7 10	1 2
May -	1 10 ¹ / ₂	17 9 ¹ / ₂	11 6	-	7 10	12 5 ¹ / ₂	20 14	19 0	16 3	130 0	18 3	9 0	7 10	1 2
June -	1 9 ¹ / ₂	17 10	11 5	-	7 10	11 6	20 12	19 0	15 3	130 0	18 3	8 0	7 10	1 2
July -	1 9 ¹ / ₂	17 9 ¹ / ₂	11 5	-	7 10	11 6	19 0	18 8	15 1 ¹ / ₂	130 0	18 1 ¹ / ₂	8 0	7 10	1 2
August -	1 9 ¹ / ₂	17 7 ¹ / ₂	11 5	-	7 10	11 6	19 0	-	15 3	130 0	15 3	8 0	7 10	1 2
September -	1 9 ¹ / ₂	17 6 ¹ / ₂	11 5	-	7 10	13 5	19 0	-	15 0	130 0	15 0	8 0	7 10	1 2
October -	1 9 ¹ / ₂	17 5 ¹ / ₂	11 5	-	7 10	13 5	19 0	-	15 0	130 0	15 0	8 0	7 10	1 4
November -	1 9 ¹ / ₂	18 8 ¹ / ₂	11 5	-	7 10	15 3	19 0	-	17 2	130 0	15 3	8 0	7 10	1 4
December -	1 9 ¹ / ₂	17 9	11 5	-	7 10	15 3	19 0	15 0	17 2	130 0	15 3	8 0	7 10	1 4
1876:														
January -	1 9 ¹ / ₂	17 10 ¹ / ₂	11 5 ¹ / ₂	-	7 10	15 1 ¹ / ₂	19 0	15 0	16 2 ¹ / ₂	130 0	15 3	8 0	7 10	1 4
February -	1 8 ⁹ / ₂	18 -	11 6	-	7 10	15 0	-	15 0	15 3	130 0	15 3	8 0	7 10	1 4
March -	1 8 ⁹ / ₂	18 7	11 6	-	7 10	13 5	-	15 0	15 0	130 0	15 3	8 0	7 10	1 4
April -	1 8 ⁹ / ₂	18 4 ¹ / ₂	11 6	-	7 10	13 5	-	15 0	15 0	130 0	15 3	8 0	7 10	1 4
May -	1 8 ⁹ / ₂	18 8 ¹ / ₂	11 6	-	7 10	13 5	-	15 1 ¹ / ₂	17 0	130 0	15 3	8 0	8 5	1 2 ¹ / ₂
June -	1 7 ⁹ / ₂	19 -	11 6	-	7 10	12 5 ¹ / ₂	19 0	15 0	19 0	130 0	15 0	8 0	9 0	1 1
July -	1 6 ⁹ / ₂	19 13 ¹ / ₂	11 6	-	7 10	11 6	19 0	15 0	19 0	130 0	15 0	8 0	9 0	1 1
August -	1 7 ¹ / ₂	18 14 ¹ / ₂	11 6	-	7 10	11 6	19 0	15 0	18 0	130 0	15 0	8 0	9 0	1 1
September -	1 7 ¹ / ₂	19 1	11 6	-	7 10	10 0 ¹ / ₂	19 0	-	14 8	130 0	15 0	7 8	7 10 ¹ / ₂	1 1
October -	1 8 ⁹ / ₂	18 11 ¹ / ₂	8 0	-	7 5	8 0	-	-	12 3	130 0	15 0	7 0	7 0	1 1
November -	1 8 ⁹ / ₂	18 5 ¹ / ₂	8 0	-	7 0	8 0	-	-	11 6	130 0	15 0	7 0	7 0	1 1
December -	1 9 ⁹ / ₂	17 14 ¹ / ₂	8 0	-	7 0	8 0	-	-	11 6	130 0	15 0	7 0	7 0	1 1
1877:														
January -	1 10	17 12 ¹ / ₂	8 0	-	7 0	8 0	-	-	11 0	130 0	15 0	7 0	7 0	1 1
February -	1 9 ¹ / ₂	17 14	8 10 ¹ / ₂	-	7 0	8 10 ¹ / ₂	-	-	11 0	130 0	15 0	7 0	7 0	1 1
March -	1 9 ¹ / ₂	18 -	8 10 ¹ / ₂	-	7 1	8 10 ¹ / ₂	-	-	11 3	140 0	15 0	7 5	7 5	1 1 ¹ / ₂

Statement E.—continued.

No. 8.

PRICES CURRENT OF FOOD GRAINS, &c. at *Khandeish*, from January 1874 to March 1877, with the Average Rate of EXCHANGE, and of the Value of GOLD LEAF.

K H A N D E I S H.

In the Month or	Rate of Exchange on London in Bombay. Sight Bills.	Value of China Gold Leaf per Tola in Bombay.	Wheat per Rupee.	Barley per Rupee.	Rice, Best Sort, per Rupee.	Rice, Common, per Rupee.	Jowar per Rupee.	Bajra per Rupee.	Grain per Rupee.	Firewood per Rupee.	Salt per Rupee.	Wheat Flour per Rupee.	Dall, Toor, per Rupee.	Ghee per Rupee.
874:	s. d.	Rs. a.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.
January -	1 10 ³ / ₄	16 12	18 4	-	7 11	10 0	30 7	23 7	16 5	140 0	12 1 ¹ / ₂	13 3	9 8	1 9 ¹ / ₂
February -	1 11 ¹ / ₂	16 11 ³ / ₄	23 9 ¹ / ₂	-	8 12 ³ / ₄	10 12 ¹ / ₂	31 3	24 8	19 13	150 0	12 10	16 0	12 3	1 9 ¹ / ₂
March -	1 11 ¹ / ₂	17 -	20 3	-	8 6	10 12 ¹ / ₂	32 0 ³ / ₄	24 8	17 12	150 0	12 15	15 4	12 1 ¹ / ₂	1 7
April -	1 11	17 -	18 14	-	8 11	10 11 ¹ / ₂	30 15	23 1 ¹ / ₂	15 9 ¹ / ₂	150 0	12 11 ¹ / ₂	14 4	12 3	1 12 ¹ / ₂
May -	1 10 ¹ / ₂	17 1	17 10	-	8 11	10 11 ¹ / ₂	27 0	22 11	16 11 ¹ / ₂	150 0	11 1 ¹ / ₂	14 3	12 6	1 7
June -	1 10 ¹ / ₂	17 1	18 4 ³ / ₄	-	8 11	10 11 ¹ / ₂	29 6	23 7	16 9 ¹ / ₂	150 0	11 1 ¹ / ₂	14 11	12 6	1 1 ¹ / ₂
July -	1 10 ¹ / ₂	17 2 ¹ / ₄	18 4 ³ / ₄	-	8 11	10 11 ¹ / ₂	32 6	24 12 ¹ / ₂	16 11 ¹ / ₂	150 0	11 11	16 0	12 6	1 1 ¹ / ₂
August -	1 10 ¹ / ₂	17 4	20 5	-	8 9	10 7 ¹ / ₂	34 4	25 8 ¹ / ₂	17 10 ¹ / ₂	150 0	12 6	16 0	12 5	1 6
September -	1 10 ¹ / ₂	17 3 ¹ / ₄	20 4	-	8 7	10 14	36 11	27 12 ¹ / ₂	17 8	150 0	12 11	16 0	13 12	1 12
October -	1 10 ¹ / ₂	17 3 ¹ / ₄	20 4	-	8 7	10 14	33 12	25 6	17 15	150 0	12 11	15 8	14 0	1 10 ¹ / ₂
November -	1 10 ¹ / ₂	17 3	19 6 ¹ / ₂	-	8 7	10 14	32 6 ¹ / ₂	24 8	19 4	150 0	12 14 ¹ / ₂	15 0	14 0	1 10
December -	1 10 ¹ / ₂	17 3	18 9	-	8 7	10 14	32 6 ¹ / ₂	24 8	19 4	150 0	12 14 ¹ / ₂	15 0	14 0	1 10
1875:														
January -	1 10 ³ / ₄	17 3 ¹ / ₄	19 14	-	8 7	11 12 ¹ / ₂	30 11 ¹ / ₂	25 6	19 4	150 0	13 9	15 8	15 5	1 10 ¹ / ₂
February -	1 10 ³ / ₄	17 4	21 0	-	8 7	12 10	32 5	25 2	17 7 ¹ / ₂	150 0	15 7	16 0	16 0	1 11
March -	1 10 ³ / ₄	17 4 ³ / ₄	17 15	-	8 7	12 3	32 5	25 2	16 7 ¹ / ₂	150 0	15 3	14 8	15 12 ¹ / ₂	1 6 ¹ / ₂
April -	1 10 ¹ / ₂	17 6 ³ / ₄	17 6	-	8 7	11 5 ¹ / ₂	30 4	24 7 ¹ / ₂	16 4	150 0	14 7	14 0	15 5 ¹ / ₂	1 6
May -	1 10	17 9 ³ / ₄	17 4 ¹ / ₂	-	8 7	11 4	30 4	23 12 ¹ / ₂	16 7	150 0	14 7	13 12	16 0	1 4 ¹ / ₂
June -	1 9 ¹ / ₂	17 10 ³ / ₄	16 2 ¹ / ₂	-	8 7	11 4	29 10	22 7	16 10 ¹ / ₂	150 0	14 2 ¹ / ₂	13 0	14 7 ¹ / ₂	1 4
July -	1 9 ¹ / ₂	17 9 ³ / ₄	16 3	-	8 7	11 4	28 12	22 7	16 4	150 0	13 6 ¹ / ₂	13 0	14 11	1 4
August -	1 9 ¹ / ₂	17 7 ¹ / ₂	15 12	-	8 7	11 4	28 12	22 14	16 13 ¹ / ₂	150 0	13 2 ¹ / ₂	13 0	14 14 ¹ / ₂	1 4
September -	1 9 ¹ / ₂	17 6	16 3	-	8 7	11 4	30 8 ¹ / ₂	25 2	17 14	150 0	13 14	14 0	14 4	1 5
October -	1 9 ¹ / ₂	17 5 ¹ / ₂	16 10	-	8 7	11 4	32 5	25 2	17 14	150 0	13 14	14 0	14 4	1 5
November -	1 9 ¹ / ₂	18 8 ¹ / ₂	16 13 ¹ / ₂	-	8 7	11 4	32 5	25 2	18 1	150 0	13 14	14 0	15 2	1 7 ¹ / ₂
December -	1 9 ¹ / ₂	17 9	16 7 ¹ / ₂	-	8 4 ¹ / ₂	11 6	31 5	24 0	20 8 ¹ / ₂	150 0	14 1 ¹ / ₂	13 4	16 4 ¹ / ₂	1 6 ¹ / ₂
1876:														
January -	1 9 ¹ / ₂	17 10 ¹ / ₂	15 14	-	8 2	11 8	27 12	21 15	21 9	150 0	14 0	13 0	16 9	1 7
February -	1 8 ¹ / ₂	18 -	15 14	-	8 2	11 8	27 12	21 15	21 9	150 0	14 4	13 0	16 9	1 8
March -	1 8 ¹ / ₂	18 7	17 10	-	8 2	11 8	29 7	23 12	21 12 ¹ / ₂	150 0	14 4	13 6	16 9	1 8
April -	1 8 ¹ / ₂	18 4 ¹ / ₂	18 15	-	8 2	11 8	28 2 ¹ / ₂	23 12	23 5	150 0	14 14	14 0	16 10	1 6
May -	1 8 ¹ / ₂	18 8 ¹ / ₂	18 15 ¹ / ₂	-	8 2	11 8	28 9 ¹ / ₂	23 8	22 14	150 0	14 4	14 0	16 10	1 3
June -	1 7 ¹ / ₂	19 -	18 1	-	8 2	11 8	25 0 ³ / ₄	21 15	22 9	150 0	14 0	13 12	14 12	1 4 ¹ / ₂
July -	1 6 ¹ / ₂	19 13 ¹ / ₂	17 10	-	8 2	11 8	24 4	21 15	21 9	150 0	13 8	13 8	14 12	1 5
August -	1 7 ¹ / ₂	18 14 ¹ / ₂	16 8 ¹ / ₂	-	8 2	11 8	20 10 ¹ / ₂	18 4	21 1 ¹ / ₂	150 0	13 12	12 14	14 12	1 1
September -	1 7 ¹ / ₂	19 1	16 12	-	8 2	11 8	22 8	18 4 ¹ / ₂	18 13	150 0	13 12	13 0	14 12	1 3
October -	1 8 ¹ / ₂	18 11 ¹ / ₂	14 0	-	8 2	11 8	17 2 ¹ / ₂	14 13 ¹ / ₂	18 2 ¹ / ₂	150 0	13 12	11 4	14 12	1 2
November -	1 8 ¹ / ₂	18 5 ¹ / ₂	11 15 ¹ / ₂	-	7 5	9 9	14 1	12 8	13 0	150 0	13 12	8 14	11 6	1 1
December -	1 9 ¹ / ₂	17 14 ¹ / ₂	12 5 ¹ / ₂	-	7 5	10 9	15 9	14 1	14 10 ¹ / ₂	140 8	13 12	9 10	11 5	1 2 ¹ / ₂
1877:														
January -	1 10	17 12 ¹ / ₂	18 14 ¹ / ₂	-	8 2	10 9	16 0	14 11 ¹ / ₂	16 2	112 0	14 2	10 6	12 7	1 4
February -	1 9 ¹ / ₂	17 14	18 4 ¹ / ₂	-	8 2	10 9	15 11 ¹ / ₂	13 11 ¹ / ₂	14 13	112 0	14 4	10 0	12 6 ¹ / ₂	1 4
March -	1 9 ¹ / ₂	18 -	18 0 ¹ / ₂	-	8 2	10 9	17 3	14 5 ¹ / ₂	14 7 ¹ / ₂	112 0	14 4	10 2	11 6	1 4

NASIK.

In the Month of	Rate of Exchange on London in Bombay. Sight Bills.	Value of China Gold Leaf per Tola in Bombay.	Wheat per Rupee.	Barley per Rupee.	Rice, Best Sort, per Rupee.	Rice, Common, per Rupee.	Jowar per Rupee.	Bajra per Rupee.	Gram per Rupee.	Firewood per Rupee.	Salt per Rupee.	Wheat Flour per Rupee.	Dall, Toor, per Rupee.	Ghee per Rupee.
1874:	s. d.	Rs. a.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.
January	1 10 ¹ / ₂	16 12	15 10	-	5 4 ¹ / ₂	12 0	22 3	25 3	15 11	94 3	15 11	11 0 ¹ / ₂	11 4 ¹ / ₂	1 4 ¹ / ₂
February	1 11 ¹ / ₂	16 11 ¹ / ₂	9 14	-	6 0	13 8	28 4 ¹ / ₂	26 14	18 12 ¹ / ₂	107 8	17 11	13 0	16 8	1 8
March	1 11 ¹ / ₂	16 12 ¹ / ₂	17 7	-	6 0	13 8	28 4 ¹ / ₂	26 14	17 8	107 8	17 11	13 0	13 13	1 4
April	1 11	17 -	17 7	-	6 0	13 8	28 4 ¹ / ₂	25 12 ¹ / ₂	17 0	107 8	17 11	13 0	12 5	1 3
May	1 10 ¹ / ₂	17 1	17 1 ¹ / ₂	-	6 0	13 8	28 4 ¹ / ₂	24 12 ¹ / ₂	16 3	107 8	16 1 ¹ / ₂	13 0	12 0	1 5
June	1 10 ¹ / ₂	17 1	16 14	-	6 0	13 8	28 4 ¹ / ₂	24 4	17 0	107 8	14 8	13 0	13 0	1 8
July	1 10 ¹ / ₂	17 2 ¹ / ₂	17 12	-	6 0	12 11	28 4 ¹ / ₂	25 10	17 11	107 8	14 8	13 0	13 8	1 8
August	1 10 ¹ / ₂	17 4	17 12 ¹ / ₂	-	6 0	12 8	28 5	26 4	16 12	107 2	14 8	12 10	13 8	1 10
September	1 10 ¹ / ₂	17 3 ¹ / ₂	17 6 ¹ / ₂	-	6 0	12 0	28 6	29 6 ¹ / ₂	16 7	106 12	14 8	12 2	13 9	1 14 ¹ / ₂
October	1 10 ¹ / ₂	17 4	17 10	-	6 0	11 10	28	30 7 ¹ / ₂	17 0	106 12	15 9	12 0	14 10	1 12
November	1 10 ¹ / ₂	17 3	15 0	-	6 0	11 4	-	28 6	18 7	106 12	16 14	10 0	13 8	1 11
December	1 10 ¹ / ₂	17 3	15 0	-	6 0	11 4	-	28 6	18 7	106 12	16 14	10 0	13 8	1 11
1875:														
January	1 10 ¹ / ₂	17 3 ¹ / ₂	15 11	6 14	6 0	12 0	22 11	28 6	18 7	117 6	17 10	11 8	16 8	1 8
February	1 10 ¹ / ₂	17 4	15 11	8 0	6 0	12 0	25 9	28 6	19 6	128 0	17 10	12 2	15 0	1 10
March	1 10 ¹ / ₂	17 4 ¹ / ₂	16 5 ¹ / ₂	8 0	6 0	12 0	25 9	28 6	21 4	128 0	17 10	14 0	15 0	1 7
April	1 10 ¹ / ₂	17 6 ¹ / ₂	17 0	8 0	6 0	12 0	25 9	26 15	21 4	128 0	16 15	13 14 ¹ / ₂	15 12	1 6 ¹ / ₂
May	1 10	17 9 ¹ / ₂	16 6	8 0	5 15 ¹ / ₂	11 15	28 0	23 4	20 14	128 0	14 1	12 12	16 1	1 6 ¹ / ₂
June	1 9 ¹ / ₂	17 10	17 5	8 1	5 15	11 14	28 0	22 8	19 14	128 0	12 12	13 0	15 7 ¹ / ₂	1 6
July	1 9 ¹ / ₂	17 9 ¹ / ₂	16 8 ¹ / ₂	8 1	5 15	11 14	28 0	21 13 ¹ / ₂	19 14	128 0	12 12	13 0	15 4	1 5
August	1 9 ¹ / ₂	17 7 ¹ / ₂	15 12	8 1	5 15	11 14	22 6	21 3	18 12 ¹ / ₂	117 5	12 12	13 0	15 4	1 4
September	1 9 ¹ / ₂	17 6	15 11 ¹ / ₂	8 1	5 15	11 14	-	19 12	18 12 ¹ / ₂	106 10	12 12	11 0	14 5	1 4
October	1 9 ¹ / ₂	17 5 ¹ / ₂	16 4 ¹ / ₂	8 1	5 15	11 14	-	20 10	19 14	160 0	12 12	11 0	14 4	1 5 ¹ / ₂
November	1 9 ¹ / ₂	18 8 ¹ / ₂	15 12	8 1	5 15	11 14	-	21 3	21 7 ¹ / ₂	133 11 ¹ / ₂	12 12	11 0	14 4	1 6
December	1 9 ¹ / ₂	17 9	15 12	9 9	5 15	11 14	22 6	20 4 ¹ / ₂	23 9 ¹ / ₂	124 0	13 3 ¹ / ₂	11 0	12 10	1 6
1876:														
January	1 9 ¹ / ₂	17 10 ¹ / ₂	16 13	11 1	5 15	12 7	24 8	20 4 ¹ / ₂	23 12	120 14	14 3	11 6	11 15	1 6
February	1 8 ¹ / ₂	18 - ¹ / ₂	18 10	11 1	5 15	13 5 ¹ / ₂	28 0	21 3	25 9	135 2	14 1 ¹ / ₂	12 0	12 7 ¹ / ₂	1 6
March	1 8 ¹ / ₂	18 4 ¹ / ₂	19 14	11 1	5 15	13 6	28 0	19 15	25 9	142 4	15 10	12 0	11 6	1 6
April	1 8 ¹ / ₂	18 4 ¹ / ₂	18 10	11 1	5 15	11 14	26 15 ¹ / ₂	19 1	25 9	160 0	15 1 ¹ / ₂	12 0	11 6	1 6
May	1 8 ¹ / ₂	18 8 ¹ / ₂	18 10	11 1	5 15	11 14	27 2 ¹ / ₂	19 13	25 1 ¹ / ₂	153 13 ¹ / ₂	14 3	12 0	11 6	1 5 ¹ / ₂
June	1 7 ¹ / ₂	19 - ¹ / ₂	17 3	11 1	5 15	11 14	24 5 ¹ / ₂	16 15	23 3 ¹ / ₂	142 3	12 12	12 0	11 6	1 4
July	1 6 ¹ / ₂	19 13 ¹ / ₂	17 3	11 1	5 15	11 14	25 8	16 15	24 2	142 0	12 12	12 0	11 6	1 4
August	1 7 ¹ / ₂	18 14 ¹ / ₂	17 3	16 2	5 15	11 14	26 10	18 6	22 10	128 0	14 3	12 0	11 6	1 4
September	1 7 ¹ / ₂	19 1	16 9 ¹ / ₂	15 13	5 15	11 1 ¹ / ₂	24 13	16 8	21 4	140 0	13 9 ¹ / ₂	11 10	11 6	1 2
October	1 8 ¹ / ₂	18 11 ¹ / ₂	13 8	13 0 ¹ / ₂	5 15	10 3 ¹ / ₂	23 10 ¹ / ₂	12 12 ¹ / ₂	16 8	142 0	14 1 ¹ / ₂	9 4	10 9 ¹ / ₂	1 1 ¹ / ₂
November	1 8 ¹ / ₂	18 5 ¹ / ₂	11 10 ¹ / ₂	13 0 ¹ / ₂	5 15	8 11	14 8 ¹ / ₂	10 13	14 4 ¹ / ₂	151 0	14 2	7 14	10 9 ¹ / ₂	1 1
December	1 9 ¹ / ₂	17 14 ¹ / ₂	12 14 ¹ / ₂	-	5 15	9 7	16 6 ¹ / ₂	12 6 ¹ / ₂	15 9	106 0	15 6 ¹ / ₂	9 0	9 12	1 2 ¹ / ₂
1877:														
January	1 10	17 12 ¹ / ₂	12 7	-	5 15	9 12 ¹ / ₂	16 1	12 11	14 13 ¹ / ₂	160 0	15 9	9 0	9 15	1 3 ¹ / ₂
February	1 9 ¹ / ₂	17 14	12 14	-	5 15	10 6	15 14 ¹ / ₂	13 11	14 12	160 0	15 9	9 4	9 15	1 4
March	1 9 ¹ / ₂	18 -	12 8	-	5 15	10 6	15 6	12 11	14 13	160 0	14 13 ¹ / ₂	9 9 ¹ / ₂	9 15	1 4

Statement E—continued.

No. 10.

PRICES CURRENT OF FOOD GRAINS, &c. at Ahmednuggar, from January 1874 to March 1877, with the Average Rate of Exchange and of the Value of GOLD LEAF.

AHMEDNUGGAR.

In the Month of	Rate of Exchange on London in Bombay. Sight Bills.	Value of China Gold Leaf per Tola in Bombay.	Wheat per Rupee.	Barley per Rupee.	Rice, Best Sort, per Rupee.	Rice, Common, per Rupee.	Jowar per Rupee.	Bajra per Rupee.	Gram per Rupee.	Firewood per Rupee.	Salt per Rupee.	Wheat Flour per Rupee.	Dall, Toor, per Rupee.	Ghee per Rupee.
1874:														
January	1 10 ³ / ₄	16 12	25 9	31 10	10 8	10 8	39 3	29 14	19 12	93 4 ¹ / ₂	14 0	18 11	14 11	1 9 ¹ / ₂
February	1 11 ¹ / ₈	16 11 ¹ / ₂	—	—	—	—	—	—	—	—	—	—	—	—
March	1 11 ¹ / ₄	16 12 ¹ / ₂	23 6	39 12	9 0	10 8	39 12	31 15	21 13	100 0	15 1 ¹ / ₂	17 0	19 8	1 9 ¹ / ₂
April	1 11	17 1	24 0	38 4	8 13	10 8	39 6	30 15	21 12 ¹ / ₂	100 0	15 3	17 8	19 11	1 9
May	1 10 ³ / ₄	17 1	22 5	36 0	9 0	9 8	38 4	29 4	21 0	100 0	12 12	16 0	17 4	1 9 ¹ / ₂
June	1 10 ³ / ₄	17 1	22 7	36 0	9 0	10 0 ³ / ₄	38 4	31 12 ¹ / ₂	21 9	103 6	13 4 ¹ / ₂	16 4 ¹ / ₂	17 3	1 11
July	1 10 ³ / ₄	17 2 ¹ / ₄	23 9 ¹ / ₂	48 2	9 9 ¹ / ₂	10 0 ³ / ₄	45 7	33 12 ¹ / ₂	22 9	100 0	13 4	17 8	18 0	2 0
August	1 10 ³ / ₄	17 4	23 0	60 0	9 15	9 6	45 12	35 6	23 0	100 0	13 10	16 12 ¹ / ₂	18 12	1 12 ¹ / ₂
September	1 10 ³ / ₄	17 3 ¹ / ₄	23 13	57 3	9 8	9 6	55 2	36 15	22 8	114 3 ¹ / ₂	13 8	17 8	19 8	1 15
October	1 10 ³ / ₄	17 4	22 15 ¹ / ₂	41 12	9 0	9 12	49 2 ¹ / ₂	34 8	22 1 ¹ / ₄	106 10	12 5	17 0	20 2	2 0
November	1 10 ³ / ₄	17 4	18 7 ¹ / ₂	41 4	9 3 ¹ / ₄	10 0 ³ / ₄	38 4	29 3 ¹ / ₂	20 10 ¹ / ₄	106 10	13 11 ¹ / ₂	16 0	19 4	1 15
December	1 10 ³ / ₄	17 3	—	—	—	—	—	—	—	—	—	—	—	—
1875:														
January	1 10 ³ / ₄	17 3 ¹ / ₄	17 9	43 7	9 15	11 4 ¹ / ₂	38 15 ¹ / ₂	33 8	22 1	106 10 ¹ / ₂	14 2 ¹ / ₂	15 9 ¹ / ₂	19 4	1 13
February	1 10 ³ / ₄	17 4	19 9	—	10 7	11 5 ¹ / ₂	41 13	33 4 ¹ / ₂	25 3 ¹ / ₄	106 10 ¹ / ₂	14 0	15 8	22 10 ¹ / ₂	1 11 ¹ / ₂
March	1 10 ³ / ₄	17 4 ¹ / ₂	19 0	—	9 14 ¹ / ₂	10 12	38 9	32 0	24 3	106 10 ¹ / ₂	14 2	15 0	23 13 ¹ / ₂	1 11
April	1 10 ³ / ₄	17 6 ¹ / ₂	18 15 ¹ / ₂	—	9 8	10 6 ¹ / ₂	38 7 ¹ / ₂	31 10	24 4 ¹ / ₂	106 10 ¹ / ₂	14 0	15 8	24 11 ¹ / ₂	1 6
May	1 10 ³ / ₄	17 9 ¹ / ₂	17 14 ¹ / ₂	—	9 13 ¹ / ₂	9 14	34 11 ¹ / ₂	28 14 ¹ / ₂	23 5	106 13 ¹ / ₂	11 9 ¹ / ₂	14 6	27 2 ¹ / ₂	1 5
June	1 10 ³ / ₄	17 10	17 0 ¹ / ₂	—	8 15	9 14	33 8	25 12 ¹ / ₂	24 12 ¹ / ₂	106 10 ¹ / ₂	12 1	12 12	23 13 ¹ / ₂	1 4 ¹ / ₂
July	1 9 ¹ / ₂	17 10 ¹ / ₂	16 5	—	8 13 ¹ / ₂	9 10 ¹ / ₂	33 5 ¹ / ₂	25 9 ¹ / ₂	24 4 ¹ / ₂	106 10 ¹ / ₂	12 1	13 13	23 10	1 5
August	1 9 ¹ / ₂	17 7 ¹ / ₂	15 15	—	8 13	9 11 ¹ / ₂	33 0 ¹ / ₂	26 2	24 15 ¹ / ₂	115 7 ¹ / ₂	12 1	13 0	21 9 ¹ / ₂	1 4 ¹ / ₂
September	1 9 ¹ / ₂	17 6	16 10 ¹ / ₂	—	9 14	10 13 ¹ / ₂	34 11 ¹ / ₂	28 2	24 15 ¹ / ₂	106 10 ¹ / ₂	12 1	13 0	22 12	1 5
October	1 9 ¹ / ₂	17 5 ¹ / ₂	16 13 ¹ / ₂	—	9 12 ¹ / ₂	10 15 ¹ / ₂	34 0 ¹ / ₂	29 1	24 15 ¹ / ₂	123 0 ¹ / ₂	12 1	13 0	24 1	1 10
November	1 9 ¹ / ₂	18 8 ¹ / ₂	16 2	—	9 6 ¹ / ₂	10 15 ¹ / ₂	34 3 ¹ / ₂	25 12 ¹ / ₂	26 5 ¹ / ₂	106 10 ¹ / ₂	13 5 ¹ / ₂	13 0	26 1	1 9 ¹ / ₂
December	1 9 ¹ / ₂	17 9	17 9 ¹ / ₂	—	9 12	10 15 ¹ / ₂	31 10	25 0 ¹ / ₂	27 14	106 10 ¹ / ₂	13 8	13 8	24 4 ¹ / ₂	1 8
1876:														
January	1 9 ¹ / ₂	17 10 ¹ / ₂	17 0	—	9 12	10 9	31 10	23 15	28 1 ¹ / ₂	106 10 ¹ / ₂	13 11 ¹ / ₂	13 8 ¹ / ₂	23 12 ¹ / ₂	1 8
February	1 8 ¹ / ₂	18 1 ¹ / ₂	19 9	—	9 13 ¹ / ₂	9 13 ¹ / ₂	30 6 ¹ / ₂	22 6	28 10 ¹ / ₂	106 10 ¹ / ₂	12 15 ¹ / ₂	14 4	22 11 ¹ / ₂	1 8
March	1 8 ¹ / ₂	18 7 ¹ / ₂	20 1 ¹ / ₂	—	8 13 ¹ / ₂	9 13 ¹ / ₂	30 4	22 8	26 13 ¹ / ₂	106 10 ¹ / ₂	14 4	15 5 ¹ / ₂	22 11 ¹ / ₂	1 8
April	1 8 ¹ / ₂	18 4 ¹ / ₂	20 4 ¹ / ₂	—	9 8	10 3	30 1	22 9	26 0	106 10 ¹ / ₂	14 4	15 8	23 12 ¹ / ₂	1 8
May	1 7 ¹ / ₂	18 8 ¹ / ₂	20 4 ¹ / ₂	—	8 13 ¹ / ₂	9 7 ¹ / ₂	30 1	22 9	25 5	98 5	13 12 ¹ / ₂	15 0	25 5 ¹ / ₂	1 6
June	1 7 ¹ / ₂	19 13 ¹ / ₂	19 14 ¹ / ₂	—	8 13 ¹ / ₂	9 14	27 13 ¹ / ₂	20 14 ¹ / ₂	24 1 ¹ / ₂	93 4 ¹ / ₂	12 14 ¹ / ₂	15 9	21 14	1 6
July	1 7 ¹ / ₂	19 13 ¹ / ₂	17 9 ¹ / ₂	—	8 13 ¹ / ₂	10 6 ¹ / ₂	26 4	18 10 ¹ / ₂	24 7	106 10 ¹ / ₂	12 14 ¹ / ₂	15 0	21 3 ¹ / ₂	1 4 ¹ / ₂
August	1 7 ¹ / ₂	18 13 ¹ / ₂	17 9 ¹ / ₂	—	8 13 ¹ / ₂	9 14	26 4	19 14 ¹ / ₂	24 7	106 10 ¹ / ₂	12 14 ¹ / ₂	15 0	21 3 ¹ / ₂	1 4 ¹ / ₂
September	1 7 ¹ / ₂	19 1	15 9 ¹ / ₂	—	8 13 ¹ / ₂	9 14	18 3	16 14 ¹ / ₂	18 11 ¹ / ₂	106 10 ¹ / ₂	11 6 ¹ / ₂	13 2	19 15 ¹ / ₂	1 1 ¹ / ₂
October	1 7 ¹ / ₂	18 11 ¹ / ₂	12 1	—	8 7	9 3 ¹ / ₂	13 9 ¹ / ₂	12 1	11 6 ¹ / ₂	106 10 ¹ / ₂	12 4 ¹ / ₂	10 4	16 2	1 0
November	1 8 ¹ / ₂	18 5 ¹ / ₂	10 6 ¹ / ₂	—	6 11 ¹ / ₂	7 12	11 7 ¹ / ₂	10 7	11 6 ¹ / ₂	112 10	11 10	8 5	12 0	1 0
December	1 9 ¹ / ₂	17 14 ¹ / ₂	12 8	—	7 9	8 8	12 15 ¹ / ₂	12 12 ¹ / ₂	14 4	106 10 ¹ / ₂	13 1 ¹ / ₂	9 12	11 11 ¹ / ₂	1 0 ¹ / ₂
1877:														
January	1 10	17 12 ¹ / ₂	12 10 ¹ / ₂	—	8 2	8 14	13 4	12 12 ¹ / ₂	14 8 ¹ / ₂	106 10 ¹ / ₂	14 4	9 8	12 4	1 2
February	1 9 ¹ / ₂	17 14	11 8	—	7 4 ¹ / ₂	8 5	11 13 ¹ / ₂	11 11	12 6	106 10 ¹ / ₂	14 4	9 0	10 6 ¹ / ₂	1 1
March	1 9 ¹ / ₂	18 —	11 5	—	7 0	8 5	11 13 ¹ / ₂	11 11	12 6	106 10 ¹ / ₂	13 14	9 0	10 5	1 1

POONA.

PAPERS RELATING TO SILVER.

In the Month of	Rate of Exchange on London in Bombay. Sight Bills.	Value of China Gold Leaf per Tola in Bombay.	Wheat per Rupee.	Barley per Rupee.	Rice, Best Sort, per Rupee.	Rice, Common, per Rupee.	Jowar per Rupee.	Bajra per Rupee.	Gram per Rupee.	Firewood per Rupee.	Salt per Rupee.	Wheat Flour per Rupee.	Dall, Toor, per Rupee.	Ghee per Rupee.
1874:	s. d.	Rs. a.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.
January -	1 10 $\frac{1}{2}$	16 12	14 13	-	10 3	12 2	26 14	20 8	14 9 $\frac{1}{2}$	80 0	15 0	15 0	11 5	1 6
February -	1 11 $\frac{1}{2}$	16 11 $\frac{1}{2}$	-	-	-	-	-	-	-	-	-	-	-	-
March -	1 11 $\frac{1}{2}$	16 12 $\frac{1}{2}$	-	-	-	-	-	-	-	-	-	-	-	-
April -	1 11	17 -	17 9 $\frac{1}{2}$	-	11 3	13 9 $\frac{1}{2}$	28 12 $\frac{1}{2}$	22 0	15 11	80 0	16 0	15 0	12 11	1 9 $\frac{1}{2}$
May -	1 11	17 -	16 8	-	10 11	12 7	28 12 $\frac{1}{2}$	21 7	15 11	80 0	16 0	14 8	12 11	1 6
June -	1 10 $\frac{1}{2}$	17 1	15 15	-	10 3	11 4 $\frac{1}{2}$	28 12 $\frac{1}{2}$	20 14	15 11	80 0	15 7	14 0	12 11	1 6
July -	1 10 $\frac{1}{2}$	17 2 $\frac{1}{2}$	16 9 $\frac{1}{2}$	-	10 3	11 4 $\frac{1}{2}$	31 3	22 9	16 13	80 0	14 4	14 0	12 11	1 9 $\frac{1}{2}$
August -	1 10 $\frac{1}{2}$	17 4	16 8 $\frac{1}{2}$	-	10 3	11 5	33 9 $\frac{1}{2}$	24 3	18 0	80 0	13 9 $\frac{1}{2}$	14 0	12 11 $\frac{1}{2}$	1 10 $\frac{1}{2}$
September -	1 10 $\frac{1}{2}$	17 3 $\frac{1}{2}$	16 8 $\frac{1}{2}$	-	9 1	10 3	32 7 $\frac{1}{2}$	23 10	18 0	80 0	13 9	12 0	13 4 $\frac{1}{2}$	1 13
October -	1 10 $\frac{1}{2}$	17 4	14 4 $\frac{1}{2}$	-	8 8	9 10	32 6	23 8	15 12	80 0	13 9	12 0	13 13 $\frac{1}{2}$	1 14
November -	1 10 $\frac{1}{2}$	17 4	13 12	-	8 8	9 10	33 9	24 3	16 14	80 0	13 9	11 8	13 13	1 14
December -	1 10 $\frac{1}{2}$	17 3	14 5	-	10 3 $\frac{1}{2}$	11 5 $\frac{1}{2}$	34 12 $\frac{1}{2}$	25 4 $\frac{1}{2}$	18 0	80 0	14 13	12 0	13 13	1 15
1875:														
January -	1 10 $\frac{3}{4}$	17 3 $\frac{1}{2}$	13 10	9 4	10 15	12 4	30 7	25 5	18 3	80 0	14 5	12 8	15 15	1 12
February -	1 10 $\frac{3}{4}$	17 4	15 15	9 4	10 15	13 8	30 7	25 5 $\frac{1}{2}$	21 10	93 8	14 5	13 10	19 14 $\frac{1}{2}$	1 12
March -	1 10 $\frac{3}{4}$	17 4 $\frac{1}{2}$	15 12	9 4	10 15	12 4	28 4	23 0	24 8	100 3 $\frac{1}{2}$	13 12	13 8	20 8	1 6
April -	1 10 $\frac{3}{4}$	17 6 $\frac{1}{2}$	15 5 $\frac{1}{2}$	10 3	10 15 $\frac{1}{2}$	11 4	28 4	23 0	20 0 $\frac{1}{2}$	97 8	13 4 $\frac{1}{2}$	11 0	20 6	1 7
May -	1 10	17 9 $\frac{1}{2}$	14 15	10 3	11 0	12 4	28 4	23 0	19 9	95 0	13 6	9 10	20 4	1 6
June -	1 9 $\frac{7}{8}$	17 10	14 6	10 3	10 7	11 10	27 3	20 11	19 9	95 0	13 6	9 10	19 2	1 5
July -	1 9 $\frac{7}{8}$	17 9 $\frac{1}{2}$	13 13	10 3	10 7	11 10	27 3	20 11	19 9	95 0	13 6	9 10	19 2	1 4
August -	1 9 $\frac{7}{8}$	17 7 $\frac{1}{2}$	13 13	10 3	10 7	11 10	27 3	20 11	19 9	76 0	13 6	9 10	19 2	1 3
September -	1 9 $\frac{7}{8}$	17 7 $\frac{1}{2}$	13 13	10 3	10 7	11 10	27 3	20 11	19 9	76 0	13 6	9 10	19 2	1 3
October -	1 9 $\frac{7}{8}$	17 5 $\frac{1}{2}$	13 13	10 3	8 9	11 0	27 3	20 11	19 5 $\frac{1}{2}$	76 0	13 6	9 10	19 2	1 7
November -	1 9 $\frac{7}{8}$	18 8 $\frac{1}{2}$	13 3 $\frac{1}{2}$	10 3	8 9	9 13	26 2	18 6	20 11 $\frac{1}{2}$	76 0	13 6	9 10	19 2	1 7
December -	1 9 $\frac{1}{2}$	17 9	13 13	10 3	11 0 $\frac{1}{2}$	12 4	28 4	20 11	22 7	76 0	13 6	9 10	19 2	1 10
1876:														
January -	9 $\frac{1}{2}$	17 10 $\frac{1}{2}$	13 13	10 3	10 11 $\frac{1}{2}$	11 15	25 0 $\frac{1}{2}$	18 15 $\frac{1}{2}$	23 0	76 0	13 6	9 10	19 2	1 10
February -	1 8 $\frac{1}{2}$	18 0 $\frac{1}{2}$	13 13	10 3	9 13	11 0	21 12	18 6	23 0	76 0	13 14 $\frac{1}{2}$	9 10	19 2	1 9
March -	1 8 $\frac{1}{2}$	18 7	13 13	10 3	9 13	11 0	21 12	18 6	21 14	101 0	14 7	9 10	18 0	1 9
April -	1 8 $\frac{1}{2}$	18 4 $\frac{1}{2}$	13 13	10 3	9 13	11 0	21 12	17 4	20 11	101 0	13 6	9 10	18 0	1 9
May -	1 8 $\frac{1}{2}$	18 8 $\frac{1}{2}$	13 13	9 4 $\frac{1}{2}$	9 13	11 0	21 12	16 11	20 11	101 0	13 10	9 10	18 0	1 9
June -	1 7 $\frac{1}{2}$	19 -	13 13	10 3	9 13	11 0	20 11	15 8 $\frac{1}{2}$	20 11	101 0	13 14	9 10	16 14	1 7
July -	1 6 $\frac{1}{2}$	19 13 $\frac{1}{2}$	13 13	10 3	9 13	11 0	20 11	14 15	20 11	76 0	13 14	9 10	16 14	1 5
August -	1 7 $\frac{1}{2}$	18 14 $\frac{1}{2}$	13 13	10 3	9 13	11 0	20 11	14 15	20 11	76 0	13 14	9 10	16 14	1 4
September -	1 7 $\frac{1}{2}$	19 1	12 10	10 3	9 13	11 0	15 12	13 3 $\frac{1}{2}$	17 4	76 0	13 14	9 10	13 8	1 1
October -	1 8 $\frac{1}{2}$	18 11 $\frac{1}{2}$	9 12 $\frac{1}{2}$	10 3	8 9 $\frac{1}{2}$	9 12 $\frac{1}{2}$	10 14	10 1 $\frac{1}{2}$	12 1 $\frac{1}{2}$	76 0	13 6	7 0	9 0	1 1
November -	1 8 $\frac{1}{2}$	18 5 $\frac{1}{2}$	9 3	10 3	7 6	8 9	9 13	10 1	10 6	76 0	13 6	7 15 $\frac{1}{2}$	7 14	1 1
December -	1 9 $\frac{1}{2}$	17 14 $\frac{1}{2}$	9 12	-	7 6	8 9	10 14	10 15	12 1 $\frac{1}{2}$	76 0	13 14	8 10	10 2	1 2
1877:														
January -	1 10	17 12 $\frac{1}{2}$	9 12	-	7 6	8 9	11 6 $\frac{1}{2}$	11 8	13 3 $\frac{1}{2}$	76 0	15 0	8 10	10 11	1 3
February -	1 9 $\frac{1}{2}$	17 14	9 12	-	7 6	8 9	11 15	11 8	12 10	76 0	15 0	8 10	11 14	1 3
March -	1 9 $\frac{1}{2}$	18 0	9 12	-	7 6	8 9	11 15	11 8	12 10	76 0	15 0	8 10	11 0	1 3

Statement E—continued.

No. 12.

PRICES CURRENT OF FOOD GRAINS, &c. at *Sholapore*, from January 1874 to March 1877, with the Average Rate of Exchange and of the Value of GOLD LEAF.

SHOLAPORE.

In the Month of	Rate of Exchange on London in Bombay, Sight Bills.	Value of China Gold Leaf per Tola in Bombay.	Wheat per Rupee.	Barley per Rupee.	Rice, Best Sort, per Rupee.	Rice, Common, per Rupee.	Jowar per Rupee.	Bajra, per Rupee.	Gram, per Rupee.	Firewood, per Rupee.	Salt, per Rupee.	Wheat Flour per Rupee.	Dall, Toor, per Rupee.	Ghee per Rupee.
1874:	s. d.	Rs. a.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.
January -	1 10 ³ / ₄	16 12	20 3	24 7	11 9 ¹ / ₂	12 12 ¹ / ₂	33 6	30 6	16 10	87 3	13 3	14 14	11 6	1 6
February -	1 11 ¹ / ₂	16 11 ¹ / ₂	21 9 ¹ / ₂	-	12 11	13 1 ¹ / ₂	37 0	35 0	19 3	120 0	13 12	16 0	14 0	1 6
March -	1 11 ¹ / ₂	16 12 ¹ / ₂	22 8	-	14 9 ¹ / ₂	15 8 ¹ / ₂	38 6	35 0	20 1 ¹ / ₂	120 0	14 4 ¹ / ₂	16 8	18 4 ¹ / ₂	1 4 ¹ / ₂
April -	1 11	17 -	21 9 ¹ / ₂	-	12 11	14 9 ¹ / ₂	35 12 ¹ / ₂	32 4 ¹ / ₂	18 4 ¹ / ₂	120 0	14 3	16 0	15 11	1 6
May -	1 10 ¹ / ₂	17 -	18 1 ¹ / ₂	-	12 11	14 9 ¹ / ₂	35 0	31 6	17 6	100 0	13 6	14 8	14 0	1 6
June -	1 10 ¹ / ₂	17 1	18 1 ¹ / ₂	-	12 12	14 9 ¹ / ₂	36 6	29 9 ¹ / ₂	17 6	100 0	13 6	16 0	15 9 ¹ / ₂	1 6
July -	1 10 ¹ / ₂	17 2 ¹ / ₂	-	-	-	-	-	-	-	-	-	-	-	-
August -	1 10 ¹ / ₂	17 4	18 12	-	13 6 ¹ / ₂	14 10 ¹ / ₂	40 0	35 0	16 12	100 0	13 8	16 0	17 8	1 8
September -	1 10 ¹ / ₂	17 3 ¹ / ₂	20 11 ¹ / ₂	-	13 14	15 6 ¹ / ₂	45 8	45 8	19 3	100 0	13 8	16 8	17 8	1 12
October -	1 10 ¹ / ₂	17 4	21 12	-	15 11	18 8	49 0	54 4	19 4	100 0	13 8	16 0	19 4	1 14
November -	1 10 ¹ / ₂	17 3	-	-	16 3	17 12 ¹ / ₂	-	-	20 0	120 0	14 4	16 0	21 0	1 10
December -	1 10 ¹ / ₂	17	-	-	-	-	-	-	-	-	-	-	-	-
1875:	s. d.	Rs. a.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.
January -	1 10 ³ / ₄	17 3 ¹ / ₂	20 5 ¹ / ₂	-	14 10 ¹ / ₂	16 4	35 0	36 12	18 6 ¹ / ₂	130 0	13 12 ¹ / ₂	16 0	22 0	1 10
February -	1 10 ³ / ₄	17 4	21 12	-	14 12 ¹ / ₂	16 3 ¹ / ₂	33 0	33 10	22 12	220 0	14 12	16 0	24 8	1 10
March -	1 10	17 4 ¹ / ₂	19 13 ¹ / ₂	-	15 3	17 1 ¹ / ₂	31 8	31 8	25 0	160 0	15 0	16 0	24 10	1 8
April -	1 10 ¹ / ₂	17 6 ¹ / ₂	20 8	-	14 2	16 0	30 2	33 1	25 8 ¹ / ₂	115 5 ¹ / ₂	14 4	16 0	24 15 ¹ / ₂	1 6
May -	1 10	17 6 ¹ / ₂	18 15	-	13 6	15 5	27 0 ¹ / ₂	29 6	25 0	114 10	14 4	16 0	25 14 ¹ / ₂	1 6
June -	1 9 ¹ / ₂	17 10	18 1 ¹ / ₂	-	13 1	14 5	25 11 ¹ / ₂	26 14	24 5	96 9	14 1	16 0	24 8 ¹ / ₂	1 4 ¹ / ₂
July -	1 9 ¹ / ₂	17 9 ¹ / ₂	18 5	-	13 6	14 11 ¹ / ₂	27 6	26 10 ¹ / ₂	23 5 ¹ / ₂	97 0	13 5	16 2	23 12	1 7
August -	1 9 ¹ / ₂	17 7 ¹ / ₂	18 2	-	13 5	15 5 ¹ / ₂	27 9	28 14 ¹ / ₂	23 12	110 0	13 8	16 0	23 12	1 3 ¹ / ₂
September -	1 9 ¹ / ₂	17 6	18 13	-	13 5	14 13	26 3	23 4	23 4	110 0	13 4	15 10 ¹ / ₂	23 6	1 3 ¹ / ₂
October -	1 9 ¹ / ₂	17 5 ¹ / ₂	19 11	-	13 1	14 3	25 15	25 15	24 6	119 0	13 0	14 6	22 1	1 7
November -	1 9 ¹ / ₂	18 8 ¹ / ₂	19 3	-	13 5	14 4	26 7 ¹ / ₂	26 9 ¹ / ₂	24 5 ¹ / ₂	120 0	13 0	14 2	23 5	1 6
December -	1 9 ¹ / ₂	17 9	18 7 ¹ / ₂	-	13 5	15 1 ¹ / ₂	24 13	27 6	25 9	120 0	13 3	14 10	24 6 ¹ / ₂	1 10
1876:	s. d.	Rs. a.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.
January -	1 9 ¹ / ₂	17 10 ¹ / ₂	19 0 ¹ / ₂	-	13 5	14 10 ¹ / ₂	24 8 ¹ / ₂	25 8	24 6 ¹ / ₂	109 0	13 11	15 0	24 10 ¹ / ₂	1 9
February -	1 8 ¹ / ₂	18 -	18 14	-	13 5	14 2	26 6	25 12	23 11 ¹ / ₂	98 0	14 4	15 10 ¹ / ₂	22 10	1 9 ¹ / ₂
March -	1 8 ¹ / ₂	18 7	19 13	-	12 3	13 1	28 14	24 14	23 1	93 8	14 4	16 0	21 5 ¹ / ₂	1 8 ¹ / ₂
April -	1 8 ¹ / ₂	18 4 ¹ / ₂	19 11 ¹ / ₂	-	11 15 ¹ / ₂	13 0	28 7	24 0	25 2	98 0	14 4	16 0	21 5 ¹ / ₂	1 8
May -	1 8 ¹ / ₂	18 8 ¹ / ₂	19 14 ¹ / ₂	-	12 1 ¹ / ₂	13 4	26 13	23 1	24 6	106 0	14 4	16 0	22 4	1 6
June -	1 7 ¹ / ₂	19 -	18 5	-	11 6	13 3	25 5	21 5 ¹ / ₂	23 12	98 8	14 4	16 0	21 6	1 5
July -	1 6 ¹ / ₂	19 13 ¹ / ₂	18 2	-	11 3	11 6	24 4	18 14 ¹ / ₂	22 10	91 8	14 4	16 0	20 8	1 5
August -	1 7 ¹ / ₂	18 14 ¹ / ₂	15 10	-	11 3	11 13 ¹ / ₂	23 0 ¹ / ₂	17 3 ¹ / ₂	14 6	140 0	12 5 ¹ / ₂	10 0	13 7 ¹ / ₂	1 5
September -	1 7 ¹ / ₂	19 1	15 14	-	9 12	10 10	18 2	17 3 ¹ / ₂	16 10	96 12	13 2	14 6	15 12 ¹ / ₂	1 0 ¹ / ₂
October -	1 8 ¹ / ₂	18 11 ¹ / ₂	10 14	-	8 2	9 0	11 6 ¹ / ₂	10 9 ¹ / ₂	14 11 ¹ / ₂	111 12	12 0	8 14	10 12	1 0 ¹ / ₂
November -	1 8 ¹ / ₂	18 5 ¹ / ₂	9 11 ¹ / ₂	-	7 13 ¹ / ₂	8 7 ¹ / ₂	13 13 ¹ / ₂	10 1 ¹ / ₂	11 6 ¹ / ₂	116 8	12 0	8 0	9 10 ¹ / ₂	0 14 ¹ / ₂
December -	1 9 ¹ / ₂	17 14 ¹ / ₂	10 2 ¹ / ₂	-	8 5 ¹ / ₂	9 7	9 11	11 4	11 10	98 1	11 14	8 0	9 13	0 14
1877:	s. d.	Rs. a.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.
January -	1 10	17 12 ¹ / ₂	10 6 ¹ / ₂	-	8 5 ¹ / ₂	9 7	9 14 ¹ / ₂	11 7 ¹ / ₂	11 10	102 6	13 12	8 2	10 4	0 15
February -	1 9 ¹ / ₂	17 14	10 2 ¹ / ₂	-	8 1	9 7	9 11	10 9	11 14	106 10	14 0	8 2	10 4	0 14 ¹ / ₂
March -	1 9 ¹ / ₂	18 -	10 14	-	8 1	9 7	9 15	11 4	11 14	106 12	14 2	8 4	10 0 ¹ / ₂	1 0

K A L A D G I.

In the Month of	Rate of Exchange on London in Bombay. Sight Bills.	Value of China Gold Leaf per Tola in Bombay.	Wheat per Rupee.	Barley per Rupee.	Rice, Best Sort, per Rupee.	Rice, Common, per Rupee.	Jowar per Rupee.	Bajra per Rupee.	Gram per Rupee.	Firewood per Rupee.	Salt per Rupee.	Wheat Flour per Rupee.	Dall, Toor, per Rupee.	Ghee per Rupee.
1874:	s. d.	Rs. a.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.
January	1 10 ¹ / ₂	16 12	13 9 ¹ / ₂	-	9 0	9 8	23 8	23 8	11 11	102 0	12 9 ¹ / ₂	9 14	8 1 ¹ / ₂	1 0
February	1 11 ¹ / ₂	16 11 ¹ / ₂	-	-	-	-	-	-	-	-	-	-	-	-
March	1 11 ¹ / ₂	16 12 ¹ / ₂	-	-	-	-	-	-	-	-	-	-	-	-
April	1 11	17 -	17 0	0	11	8	28 8	23 8	13 8	112 14	14 8	12 0	12 0	1 4
May	1 11	17 -	17 12	0	10 0	11 0	25 8	24 0	13 8	112 14	14 4	12 0	11 8	1 4 ¹ / ₂
June	1 10 ¹ / ₂	17 1	16 0	0	10 0	12	25 0	24 8	12 8	89 8	12 0	11 8	10 12	1 4
July	1 10 ¹ / ₂	17 -	17 8	0	10 0	10 8	26 0	26 8	12 12	66 1 ¹ / ₂	13 0	13 0	10 0	1 3
August	1 10 ¹ / ₂	17 2 ¹ / ₂	20 0	0	10 8	11 0	30 0	29 0	13 8	66 1 ¹ / ₂	13 8	14 0	10 12	1 3
September	1 10 ¹ / ₂	17 4	-	-	-	-	-	-	-	-	-	-	-	-
October	1 10 ¹ / ₂	17 3 ¹ / ₂	20 8	0	9 12	10 4	31 0	31 0	13 0	60 0	12 8	14 0	10 0	1 5
November	1 10 ¹ / ₂	17 3 ¹ / ₂	21 0	0	12 0	13 0	32 0	30 0	12 0	66 0	12 8	15 0	12 8	1 5
December	1 10 ¹ / ₂	17 3	21 0	0	13 12	14 4	34 0	34 0	12 4	63 0	14 12	15 0	13 0	2 0
1875:														
January	1 10 ¹ / ₂	17 3 ¹ / ₂	19 2 ¹ / ₂	-	14 7	15 4 ¹ / ₂	34 6	32 13 ¹ / ₂	16 4	60 0	13 15	14 8	18 2	2 0
February	1 10 ¹ / ₂	17 4	24 11	-	15 2 ¹ / ₂	16 11 ¹ / ₂	34 13	36 10	23 1	60 0	13 7 ¹ / ₂	15 8	18 0	2 0
March	1 10 ¹ / ₂	17 4 ¹ / ₂	25 3	-	14 14 ¹ / ₂	16 11	36 14	37 4	22 9	60 0	13 11 ¹ / ₂	18 0	29 15 ¹ / ₂	2 0
April	1 10 ¹ / ₂	17 6 ¹ / ₂	23 3	-	13 13 ¹ / ₂	14 12 ¹ / ₂	33 13	31 11	20 9	85 0	13 1	17 0	33 0 ¹ / ₂	1 13
May	1 10 ¹ / ₂	17 9 ¹ / ₂	23 3	-	13 13	15 1	29 11 ¹ / ₂	28 11	21 1	125 0	12 13 ¹ / ₂	17 0	30 15	1 13
June	1 9 ¹ / ₂	17 10	21 3	-	11 11	14 10	25 9 ¹ / ₂	24 12	18 8	140 0	11 15 ¹ / ₂	16 8	28 0	1 13
July	1 9 ¹ / ₂	17 9 ¹ / ₂	20 3	-	11 15 ¹ / ₂	12 15	24 1	23 5 ¹ / ₂	18 12	140 0	11 5 ¹ / ₂	15 0	27 0	1 11
August	1 9 ¹ / ₂	17 7 ¹ / ₂	20 3	-	11 15	12 15	24 1	23 4	19 0	140 0	12 3	14 0	25 15 ¹ / ₂	1 9 ¹ / ₂
September	1 9 ¹ / ₂	17 6	20 11	-	12 12	14 0	26 10	24 12	19 0	140 0	11 14 ¹ / ₂	14 0	25 5 ¹ / ₂	1 8
October	1 9 ¹ / ₂	17 5 ¹ / ₂	19 2 ¹ / ₂	-	12 7 ¹ / ₂	13 7	26 9	23 7 ¹ / ₂	20 4	140 0	11 11 ¹ / ₂	13 8	25 7 ¹ / ₂	1 8
November	1 9 ¹ / ₂	18 8 ¹ / ₂	16 10	-	11 3	12 15	26 10	27 11	20 9	140 0	12 13 ¹ / ₂	14 0	24 8	1 8
December	1 9 ¹ / ₂	17 9	14 10	-	12 8	13 7 ¹ / ₂	28 11	28 11	22 9	140 0	13 4 ¹ / ₂	10 8	22 3	1 4 ¹ / ₂
1876:														
January	1 9 ¹ / ₂	17 10 ¹ / ₂	16 10	-	13 4 ¹ / ₂	14 4	28 11	28 13	21 9	140 0	13 4	10 0	19 5	1 1
February	1 8 ¹ / ₂	18 -	18 10	-	12 3 ¹ / ₂	13 7 ¹ / ₂	28 2 ¹ / ₂	26 13	19 8	140 0	12 12	12 8	17 6	2 0
March	1 8 ¹ / ₂	18 7	19 10 ¹ / ₂	-	11 11	12 15	29 13	27 13	18 9	140 0	13 4	13 0	17 9	2 0
April	1 8 ¹ / ₂	18 4 ¹ / ₂	20 3	-	12 12	14 0	28 11	27 11	20 9	140 0	12 6 ¹ / ₂	13 0	17 9	2 0
May	1 8 ¹ / ₂	18 8 ¹ / ₂	19 2	-	11 11	12 15	28 2 ¹ / ₂	27 4	19 8 ¹ / ₂	140 0	12 0	13 0	16 14 ¹ / ₂	1 13 ¹ / ₂
June	1 7 ¹ / ₂	19 -	18 2	-	11 11	12 10	25 5	24 12	16 15	140 0	11 13 ¹ / ₂	13 0	15 8	1 8
July	1 6 ¹ / ₂	19 13 ¹ / ₂	17 2	-	11 11	12 15	23 0	23 12	14 14	140 0	11 9	12 0	14 8	1 5
August	1 7 ¹ / ₂	18 14 ¹ / ₂	15 10	-	11 8	11 13 ¹ / ₂	23 0 ¹ / ₂	22 4	14 6	140 0	12 5 ¹ / ₂	10 0	13 7 ¹ / ₂	1 5
September	1 7 ¹ / ₂	19 1	14 1 ¹ / ₂	-	9 9	10 12	17 14 ¹ / ₂	16 4	11 4	140 0	12 6	10 0	9 2	1 0 ¹ / ₂
October	1 8 ¹ / ₂	18 11 ¹ / ₂	8 1	-	5 9	6 7	8 11	7 14	8 4	140 0	11 2	6 12	6 12	1 0 ¹ / ₂
November	1 8 ¹ / ₂	18 5 ¹ / ₂	6 0	-	5 9	5 14 ¹ / ₂	6 2	5 15	7 7	140 0	9 15	4 4	5 4 ¹ / ₂	0 13 ¹ / ₂
December	1 9 ¹ / ₂	17 14 ¹ / ₂	7 1	-	5 13	6 7	7 11 ¹ / ₂	7 10	8 13	145 0	10 11	5 0	5 12	0 14 ¹ / ₂
1877:														
January	1 10	17 12 ¹ / ₂	7 5	-	-	6 7 ¹ / ₂	7 15	-	8 15 ¹ / ₂	155 0	13 11	5 8	5 12	0 15
February	1 9 ¹ / ₂	17 14	7 1	-	6 5 ¹ / ₂	7 0	8 3	-	8 15 ¹ / ₂	133 0	13 4	6 0	6 0	0 15
March	1 9 ¹ / ₂	18 -	6 0	-	5 13	6 7	7 6 ¹ / ₂	-	7 11	160 0	10 11	5 4	6 0	1 0

Statement E—continued.

No. 14.

PRICES CURRENT OF FOOD GRAINS, &c. at Sattara from January 1874 to March 1877, with the Average RATE of EXCHANGE and of the Value of GOLD LEAF.

SATTARA.

In the Month of	Rate of Exchange on London in Bombay. Sight Bills.	Value of China Gold Leaf per Tola in Bombay.	Wheat per Rupee.	Barley per Rupee.	Rice, Best Sort, per Rupee.	Rice, Common, per Rupee.	Jowar per Rupee.	Rajra per Rupee.	Gram per Rupee.	Firewood per Rupee.	Salt per Rupee.	Wheat Flour per Rupee.	Dall, Toor, per Rupee.	Ghee per Rupee.
1874.														
January	1 10 $\frac{1}{2}$	16 12	17 4 $\frac{1}{2}$	18 11	12 14	12 14	28 12	25 13	15 9 $\frac{1}{2}$	119 8	15 0 $\frac{1}{2}$	14 14	14 2	1 9 $\frac{1}{2}$
February	1 11 $\frac{1}{2}$	16 11 $\frac{1}{2}$	18 5 $\frac{1}{2}$	14 11	13 11	13 11	32 11	30 5 $\frac{1}{2}$	18 9 $\frac{1}{2}$	158 14	17 4 $\frac{1}{2}$	16 0	18 6	1 8
March	1 11 $\frac{1}{2}$	16 12 $\frac{1}{2}$	17 9 $\frac{1}{2}$	14 11	13 11	13 11	33 9 $\frac{1}{2}$	31 1 $\frac{1}{2}$	18 9 $\frac{1}{2}$	158 14	17 4 $\frac{1}{2}$	17 0	18 6	1 8
April	1 11	17 -	17 9 $\frac{1}{2}$	14 11	13 11	13 11	29 9 $\frac{1}{2}$	28 4 $\frac{1}{2}$	15 1 $\frac{1}{2}$	158 14	17 4 $\frac{1}{2}$	17 0	18 6	1 8
May	1 11	17 1	17 9 $\frac{1}{2}$	14 11	13 11	13 11	29 9 $\frac{1}{2}$	28 4 $\frac{1}{2}$	15 1 $\frac{1}{2}$	158 14	17 4 $\frac{1}{2}$	17 0	18 6	1 8
June	1 10 $\frac{1}{2}$	17 1	17 9 $\frac{1}{2}$	14 11	13 11	13 11	29 9 $\frac{1}{2}$	28 4 $\frac{1}{2}$	15 1 $\frac{1}{2}$	158 14	17 4 $\frac{1}{2}$	17 0	18 6	1 8
July	1 10 $\frac{1}{2}$	17 1	17 9 $\frac{1}{2}$	14 11	13 11	13 11	29 9 $\frac{1}{2}$	28 4 $\frac{1}{2}$	15 1 $\frac{1}{2}$	158 14	17 4 $\frac{1}{2}$	17 0	18 6	1 8
August	1 10 $\frac{1}{2}$	17 2 $\frac{1}{2}$	19 1 $\frac{1}{2}$	20 5	13 11	13 11	35 10	34 1 $\frac{1}{2}$	18 15	158 14	15 1 $\frac{1}{2}$	18 0	19 1 $\frac{1}{2}$	1 2
September	1 10 $\frac{1}{2}$	17 4	19 2	22 5	13 5	13 5	36 14	35 1	19 6	158 2	15 12	18 0	19 5	2 0
October	1 10 $\frac{1}{2}$	17 4	19 6	22 4	10 10 $\frac{1}{2}$	14 3 $\frac{1}{2}$	36 4 $\frac{1}{2}$	30 2	18 6 $\frac{1}{2}$	158 2	16 9 $\frac{1}{2}$	17 0	22 8	2 2 $\frac{1}{2}$
November	1 10 $\frac{1}{2}$	17 3	15 1 $\frac{1}{2}$	22 4	13 14	13 14	29 10	28 1 $\frac{1}{2}$	17 6	158 2	18 2	14 8	19 14	2 5
December	1 10 $\frac{1}{2}$													
1875.														
January	1 10 $\frac{1}{2}$	17 3 $\frac{1}{2}$	13 6	26 1	14 5	14 5	29 4	26 8	19 8	-	16 6	17 0	22 8	2 1 $\frac{1}{2}$
February	1 10 $\frac{1}{2}$	17 4	17 6	26 1	14 5	14 5	27 4 $\frac{1}{2}$	25 14	21 1 $\frac{1}{2}$	-	16 9	16 0	25 7	1 13 $\frac{1}{2}$
March	1 10 $\frac{1}{2}$	17 4 $\frac{1}{2}$	18 0 $\frac{1}{2}$	26 1	14 5	14 5	27 4 $\frac{1}{2}$	26 13	22 1	146 4	16 0	17 8	26 2	1 10 $\frac{1}{2}$
April	1 10 $\frac{1}{2}$	17 6 $\frac{1}{2}$	18 11	-	14 5	14 5	27 4 $\frac{1}{2}$	26 8	22 1	156 5	15 5 $\frac{1}{2}$	18 8	26 2	1 11
May	1 10	17 9 $\frac{1}{2}$	18 5 $\frac{1}{2}$	-	14 4 $\frac{1}{2}$	13 9 $\frac{1}{2}$	25 4 $\frac{1}{2}$	14 4	22 11 $\frac{1}{2}$	145 15	14 3	17 12 $\frac{1}{2}$	25 7	1 13
June	1 9 $\frac{1}{2}$	17 10	17 11	-	11 7	11 7	23 15	22 15	23 11	137 13	12 11 $\frac{1}{2}$	16 0 $\frac{1}{2}$	22 11	1 6 $\frac{1}{2}$
July	1 9 $\frac{1}{2}$	17 9 $\frac{1}{2}$	16 11	-	11 1	11 1	23 15	20 15	22 11 $\frac{1}{2}$	129 11	13 1	16 0 $\frac{1}{2}$	22 0	1 7
August	1 9 $\frac{1}{2}$	17 7 $\frac{1}{2}$	16 0	-	8 14	10 11	22 9 $\frac{1}{2}$	20 11	22 11 $\frac{1}{2}$	129 11	13 1	14 11	22 0	1 4 $\frac{1}{2}$
September	1 9 $\frac{1}{2}$	17 6	14 11	26 1	8 14	10 11	21 15	19 6	20 13	129 7	13 1	14 11	22 0	1 6
October	1 9 $\frac{1}{2}$	17 5 $\frac{1}{2}$	14 0 $\frac{1}{2}$	26 1	8 14	10 11	20 15	18 12	19 8	129 7	13 7	14 11	22 0	1 9
November	1 9 $\frac{1}{2}$	18 8 $\frac{1}{2}$	14 11	-	8 14	10 11	21 4	19 6	20 15	129 7	16 0	14 11	19 4	1 12
December	1 9 $\frac{1}{2}$	17 9	13 6	26 1	10 15	12 14	21 4	18 2	19 7 $\frac{1}{2}$	145 10	15 4 $\frac{1}{2}$	14 8	18 9	1 11
1876.														
January	1 9 $\frac{1}{2}$	17 10 $\frac{1}{2}$	12 11	26 1	10 15	12 14	19 15	17 7 $\frac{1}{2}$	18 8 $\frac{1}{2}$	145 10	14 14 $\frac{1}{2}$	13 0	18 9	1 10
February	1 8 $\frac{1}{2}$	18 -	13 11 $\frac{1}{2}$	-	10 4	12 8 $\frac{1}{2}$	19 15	16 2 $\frac{1}{2}$	19 8	145 10	16 3	13 8	18 9	1 10
March	1 8 $\frac{1}{2}$	18 7	14 11	-	9 9	12 8	19 15	16 8	19 0	145 10	16 0	13 6	18 4	1 10
April	1 8 $\frac{1}{2}$	18 4 $\frac{1}{2}$	14 11	-	9 9	11 13	19 15	16 13	18 2 $\frac{1}{2}$	156 0 $\frac{1}{2}$	16 0	14 0 $\frac{1}{2}$	18 8 $\frac{1}{2}$	1 10
May	1 8 $\frac{1}{2}$	18 8 $\frac{1}{2}$	14 11	-	9 9	11 7	18 12 $\frac{1}{2}$	16 2 $\frac{1}{2}$	18 3	166 7	16 0	13 6	17 14	1 7 $\frac{1}{2}$
June	1 6 $\frac{1}{2}$	19 13 $\frac{1}{2}$	13 11 $\frac{1}{2}$	-	9 9	11 7	18 10	14 13 $\frac{1}{2}$	16 9	156 0 $\frac{1}{2}$	15 10	12 0	16 10 $\frac{1}{2}$	1 7
July	1 6 $\frac{1}{2}$	19 13 $\frac{1}{2}$	13 11 $\frac{1}{2}$	-	9 9	11 7	19 15	16 2 $\frac{1}{2}$	17 8 $\frac{1}{2}$	145 10	15 4 $\frac{1}{2}$	12 0	17 14	1 5 $\frac{1}{2}$
August	1 7 $\frac{1}{2}$	18 14 $\frac{1}{2}$	13 6	-	9 9	10 15	18 10	17 7	17 8	145 10	14 9	12 0	17 3	1 3
September	1 7 $\frac{1}{2}$	18 11	12 0 $\frac{1}{2}$	-	7 8	8 9	13 15	17 7	14 4 $\frac{1}{2}$	145 10	14 9	11 5 $\frac{1}{2}$	13 1	1 2
October	1 8 $\frac{1}{2}$	18 11 $\frac{1}{2}$	8 11	-	7 8	8 9	10 10 $\frac{1}{2}$	9 11	11 6	145 10	13 2	8 5 $\frac{1}{2}$	11 0	1 2 $\frac{1}{2}$
November	1 8 $\frac{1}{2}$	18 5 $\frac{1}{2}$	8 11 $\frac{1}{2}$	-	6 13	7 14	8 7 $\frac{1}{2}$	8 6 $\frac{1}{2}$	9 12	145 10	12 6	7 5 $\frac{1}{2}$	8 9	1 2 $\frac{1}{2}$
December	1 9 $\frac{1}{2}$	17 14 $\frac{1}{2}$	9 14	-	7 14	8 15	10 10	10 0 $\frac{1}{2}$	10 6	156 6 $\frac{1}{2}$	13 13 $\frac{1}{2}$	8 5 $\frac{1}{2}$	9 4 $\frac{1}{2}$	1 4
1877.														
January	1 10	17 12 $\frac{1}{2}$	9 6	-	8 3	9 5	10 10	10 6	10 6	167 3	14 9	8 11	9 10	1 9
February	1 9 $\frac{1}{2}$	17 14	9 6	-	8 3	9 5	10 10	10 6	10 6	167 3	15 0	8 11	9 10	1 7
March	1 9 $\frac{1}{2}$	18 -	9 6	-	8 3	9 5	10 10	10 6	10 6	167 3	15 4 $\frac{1}{2}$	8 11	9 10	1 6 $\frac{1}{2}$

In the Month of	Rate of Exchange on London in Bombay. Sight Bills.	Value of China Gold Leaf per Tola in Bombay.	Wheat per Rupee.	Barley per Rupee.	Rice, Best Sort, per Rupee.	Rice, Common, per Rupee.	Jowar per Rupee.	Bajra per Rupee.	Gram per Rupee.	Firewood per Rupee.	Salt per Rupee.	Wheat Flour per Rupee.	Dal, Toor, per Rupee.	Ghee per Rupee.
1874:														
January	1 10 ¹ / ₂	16 12	14 6	-	13 0	13 8	19 2 ¹ / ₂	21 6	12 12	189 14	14 14	12 1 ¹ / ₂	9 4	1 8
February	1 10 ¹ / ₂	16 11 ¹ / ₂	16 0	-	14 0	14 8	20 8	23 8	14 0	150 0	17 0	13 8	13 8	1 12
March	1 11 ¹ / ₂	16 12 ¹ / ₂	15 0	-	13 12	14 4	20 8	23 0	12 4	150 0	17 0	14 0	13 0	1 10
April	1 11	17 -	15 4	-	14 4	14 12	19 8	21 0	13 4	150 0	17 0	13 4	11 4	1 11
May	1 11	17 -	15 4	-	14 4	15 0	19 12	20 4	12 0	150 0	16 8	12 11	11 4	1 9 ¹ / ₂
June	1 10 ¹ / ₂	17 1	14 8	-	14 8	15 4	19 12	20 4	12 0	150 0	16 0	14 0	11 8	1 11
July	1 10 ¹ / ₂	17 1	16 0	-	14 12	15 4	22 0	23 0	14 0	150 0	16 0	14 0	11 4	1 12 ¹ / ₂
August	1 10 ¹ / ₂	17 2 ¹ / ₂	16 8	-	15 0	15 8	23 0	23 0	15 0	150 0	16 0	14 0	11 4	1 13
September	1 10 ¹ / ₂	17 4	16 0	-	15 0	15 9	24 0	24 0	14 8	150 0	16 0	14 0	11 0	1 13
October	1 10 ¹ / ₂	17 8 ¹ / ₂	16 9	-	15 8	16 10	23 8 ¹ / ₂	26 14	12 3 ¹ / ₂	150 0	16 0	15 1	11 3	2 0
November	1 10 ¹ / ₂	17 4	17 10 ¹ / ₂	-	15 4 ¹ / ₂	16 0 ¹ / ₂	22 14	26 10 ¹ / ₂	11 11	150 0	16 0	16 2 ¹ / ₂	11 3	2 0
December	1 10 ¹ / ₂	17 3	19 6 ¹ / ₂	-	15 13 ¹ / ₂	16 8	21 5 ¹ / ₂	25 3	11 3	150 0	15 12 ¹ / ₂	17 14 ¹ / ₂	11 0	1 15
1875:														
January	1 10 ¹ / ₂	17 3 ¹ / ₂	19 8 ¹ / ₂	-	17 0 ¹ / ₂	18 0	23 10	26 10	14 14	150 0	16 0	18 0 ¹ / ₂	14 1 ¹ / ₂	2 0
February	1 10 ¹ / ₂	17 4	19 9	-	17 15	17 15	23 8	26 3 ¹ / ₂	18 2 ¹ / ₂	150 0	16 13 ¹ / ₂	18 8	14 15	2 0
March	1 10 ¹ / ₂	17 4 ¹ / ₂	20 0	-	17 14 ¹ / ₂	17 14 ¹ / ₂	23 0 ¹ / ₂	25 9 ¹ / ₂	18 12 ¹ / ₂	153 4 ¹ / ₂	16 13 ¹ / ₂	19 0	23 8	1 14
April	1 10 ¹ / ₂	17 6 ¹ / ₂	21 11	-	17 0 ¹ / ₂	17 0 ¹ / ₂	22 7	24 2	17 12 ¹ / ₂	155 8	16 12	20 9	22 0	1 14
May	1 10 ¹ / ₂	17 9 ¹ / ₂	22 0	-	16 8	17 0	22 1	24 0	19 2 ¹ / ₂	155 8	16 9 ¹ / ₂	20 9	22 4	1 1
June	1 9 ¹ / ₂	17 10	19 2 ¹ / ₂	-	16 3 ¹ / ₂	17 0	17 14	20 0 ¹ / ₂	18 7	153 5	15 9	18 2	20 8	1 1
July	1 9 ¹ / ₂	17 9 ¹ / ₂	18 9	-	15 14	16 14	18 15	19 14	17 9 ¹ / ₂	150 0	14 3 ¹ / ₂	17 9	20 8 ¹ / ₂	1 1
August	1 9 ¹ / ₂	17 7 ¹ / ₂	17 13 ¹ / ₂	-	15 3	16 3	18 10 ¹ / ₂	19 3	17 0	145 0	14 14	16 18 ¹ / ₂	20 7	1 8
September	1 9 ¹ / ₂	17 6	16 14 ¹ / ₂	-	14 10 ¹ / ₂	15 6	10 2	19 3	18 8	145 0	15 0	15 6 ¹ / ₂	18 6	1

Statement E—continued.

No. 16.

PRICES CURRENT OF FOOD GRAINS, &c. at *Dharwar* from January 1874 to March 1877, with the AVERAGE RATE OF EXCHANGE and of the Value of GOLD LEAF.

DHARWAR.

In the Month of	Rate of Exchange on London in Bombay. Sight Bills.	Value of China Gold Leaf per Tola in Bombay.	Wheat per Rupee.	Barley per Rupee.	Rice. Best Sort, per Rupee.	Rice, Common, per Rupee.	Jowar per Rupee.	Bajra per Rupee.	Gram per Rupee.	Firewood per Rupee.	Salt per Rupee.	Wheat Flour per Rupee.	Dall, Toor, per Rupee.	Ghee per Rupee.
1874:	<i>s. d.</i>	<i>Rs. a.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>
January -	1 10 ³ / ₄	16 12	13 3	-	8 5	13 13	21 4	19 14	11 0 ³ / ₄	86 6	11 9	10 6	7 6	1 3
February -	1 11 ¹ / ₄	16 11 ³ / ₄	-	-	11 13	16 0	24 12	26 0	14 5	92 11	18 6	14 0	13 9 ¹ / ₂	1 9 ¹ / ₂
March -	1 11 ¹ / ₄	16 12 ³ / ₄	20 11	-	11 8	15 4	24 11	25 8	13 15	92 11	18 0	13 14	14 7	1 10
April -	1 11	17 -	20 15	-	11 0	15 0	23 8	23 7	13 8	92 11	17 7	13 9 ¹ / ₂	13 0	1 8
May -	1 11	17 -	20 8	-	11 0	15 2	23 11	22 1 ¹ / ₂	13 4 ¹ / ₂	92 11	16 0	13 0	13 0	1 8
June -	1 10 ¹ / ₄	17 1	19 15	-	11 12	15 12	24 4	21 12 ³ / ₄	13 4 ¹ / ₂	92 11	16 0	13 2	13 4	1 15
July -	1 10 ¹ / ₄	17 1	20 6	-	12 0	15 15	24 11	23 8	13 9 ¹ / ₂	92 11	16 0	13 9 ¹ / ₂	13 0	1 12
August -	1 10 ³ / ₄	17 2 ¹ / ₄	21 6	-	12 9	16 7	27 5 ¹ / ₂	25 9 ¹ / ₂	14 0 ³ / ₄	92 11	16 0	14 0	14 0 ¹ / ₂	1 11 ¹ / ₂
September -	1 10 ¹ / ₄	17 4	22 1 ¹ / ₂	-	13 1 ¹ / ₄	16 4	26 0	25 8	13 1	92 12	13 14	14 0 ¹ / ₂	13 8	1 13
October -	1 10 ¹ / ₄	17 3 ³ / ₄	22 0 ¹ / ₂	-	11 13	16 5	25 1	23 7 ¹ / ₂	11 13	92 12	15 12	14 0	12 4	1 12 ¹ / ₂
November -	1 10 ¹ / ₄	17 4	22 0 ¹ / ₂	-	12 14 ¹ / ₂	19 14 ¹ / ₂	27 4	27 5	11 13 ¹ / ₂	-	17 4	14 1 ¹ / ₂	12 9 ¹ / ₂	1 15
December -	1 10 ¹ / ₄	17 3	22 3 ¹ / ₂	-	12 14 ¹ / ₂	19 14 ¹ / ₂	27 4	27 5	11 13 ¹ / ₂	-	17 4	14 1 ¹ / ₂	12 9 ¹ / ₂	1 15
1875:														
January -	1 10 ³ / ₄	17 3 ¹ / ₄	22 4	-	14 7 ¹ / ₂	22 3	29 3	28 10	15 9	92 11	17 0	15 0	14 11	1 14
February -	1 10 ³ / ₄	17 4	23 9	-	15 8	22 9	31 5	31 2 ¹ / ₂	19 9	92 12	18 0	15 10	22 15 ¹ / ₂	1 14
March -	1 10 ³ / ₄	17 4 ³ / ₄	26 2 ¹ / ₂	-	14 14	23 4	27 8 ¹ / ₂	29 2 ¹ / ₂	21 7	92 12	19 0	16 0	27 15 ¹ / ₂	1 14
April -	1 10 ¹ / ₄	17 6 ³ / ₄	27 11	-	15 1	22 4	28 12 ³ / ₄	30 8 ¹ / ₂	21 13 ¹ / ₂	92 12	19 0	16 3	29 10 ¹ / ₂	1 8
May -	1 10	17 9 ³ / ₄	26 12 ¹ / ₂	-	13 9 ¹ / ₂	21 0 ¹ / ₂	29 5	29 0 ¹ / ₂	20 8 ¹ / ₂	92 12	18 8 ¹ / ₂	16 0	28 6 ¹ / ₂	1 5 ¹ / ₂
June -	1 9 ¹ / ₂	17 10	25 3	-	13 0 ¹ / ₂	19 9 ¹ / ₂	26 6	26 7	18 9	92 12	15 11 ¹ / ₂	15 8	25 1	1 5 ¹ / ₂
July -	1 9 ¹ / ₂	17 9 ³ / ₄	25 1 ¹ / ₂	-	12 10 ¹ / ₂	19 13	24 15 ¹ / ₂	25 12	18 8	92 12	15 3	15 10 ¹ / ₂	24 8	1 11
August -	1 9 ¹ / ₂	17 7 ³ / ₄	23 10 ¹ / ₂	-	12 12 ¹ / ₂	19 10	24 1 ¹ / ₂	23 13 ¹ / ₂	18 15	92 12	16 0	14 10 ¹ / ₂	23 13	1 6
September -	1 9 ¹ / ₂	17 7 ³ / ₄	22 9	-	12 0	19 14	24 1	22 2 ¹ / ₂	18 15 ¹ / ₂	92 12	16 0	15 5 ¹ / ₂	24 8	1 4
October -	1 9 ¹ / ₂	17 6	20 8	-	11 1 ¹ / ₂	19 13	20 15	19 7	17 1 ¹ / ₂	92 12	16 4	15 13 ¹ / ₂	23 5 ¹ / ₂	1 5 ¹ / ₂
November -	1 9 ¹ / ₂	18 8 ¹ / ₂	19 3 ¹ / ₂	-	9 6 ¹ / ₂	15 11 ¹ / ₂	19 9 ¹ / ₂	21 15 ¹ / ₂	18 8	92 12	17 8	13 0	22 6	1 12
December -	1 9 ¹ / ₂	17 9	18 9	-	11 6	17 4 ¹ / ₂	23 0	26 10 ¹ / ₂	20 0	92 12	18 12	13 6	21 14	1 14
1876:														
January -	1 9 ¹ / ₂	17 10 ¹ / ₂	19 0	-	12 1	18 8	27 8	27 0	20 9 ¹ / ₂	92 12	18 0	13 2 ¹ / ₂	18 8 ¹ / ₂	1 14
February -	1 8 ¹ / ₂	18 1	21 12 ¹ / ₂	-	13 13	18 11	27 0 ¹ / ₂	27 15	20 6 ¹ / ₂	92 12	19 0 ¹ / ₂	14 9 ¹ / ₂	16 15 ¹ / ₂	1 14
March -	1 8 ¹ / ₂	18 7 ¹ / ₂	21 0 ¹ / ₂	-	13 18 ¹ / ₂	18 12	26 4 ¹ / ₂	26 14 ¹ / ₂	19 3	92 12	20 0	13 8	16 1	1 13
April -	1 8 ¹ / ₂	18 4 ¹ / ₂	21 0 ¹ / ₂	-	14 0	18 10 ¹ / ₂	26 11	25 14 ¹ / ₂	17 15	92 12	19 5	13 0	16 0	1 12
May -	1 8 ¹ / ₂	18 8 ¹ / ₂	20 6	-	13 9	17 6 ¹ / ₂	25 3 ¹ / ₂	26 7	16 0	92 12	17 4	13 0	14 11	1 10 ¹ / ₂
June -	1 8 ¹ / ₂	19 1	19 10	-	12 11	15 13 ¹ / ₂	23 9 ¹ / ₂	22 12 ¹ / ₂	16 0	92 12	17 9 ¹ / ₂	13 0	12 5	1 8
July -	1 7 ¹ / ₂	19 13 ¹ / ₂	18 5 ¹ / ₂	-	12 8	15 5	22 2	20 13 ¹ / ₂	15 6 ¹ / ₂	92 12	18 4	13 0	12 8	1 8
August -	1 7 ¹ / ₂	18 13 ¹ / ₂	18 0	-	12 15	14 14	22 9 ¹ / ₂	20 9 ¹ / ₂	14 11	92 12	18 0	13 0	12 3	1 8
September -	1 7 ¹ / ₂	19 1	17 1	-	11 7	13 13 ¹ / ₂	21 3 ¹ / ₂	19 3	12 13	96 6	18 0	12 3 ¹ / ₂	12 0	1 7
October -	1 8 ¹ / ₂	18 11 ¹ / ₂	11 2	-	7 3	8 10 ¹ / ₂	12 3	12 6	10 6	100 0	17 8	9 0	9 9	1 6
November -	1 8 ¹ / ₂	18 5 ¹ / ₂	7 9	-	5 12	7 4	7 9 ¹ / ₂	8 6	9 5	100 0	16 0	7 0	7 3	1 5 ¹ / ₂
December -	1 9 ¹ / ₂	17 14 ¹ / ₂	8 1 ¹ / ₂	-	6 1	7 12	9 1	10 5	9 13	100 0	15 10	6 13 ¹ / ₂	7 13	1 4 ¹ / ₂
1877:														
January -	1 10	17 12 ¹ / ₂	8 0	-	6 9	7 14	9 3	10 1	10 1	100 0	18 4	7 0	8 3 ¹ / ₂	1 4
February -	1 9 ¹ / ₂	17 14	8 4 ¹ / ₂	-	7 2 ¹ / ₂	8 4 ¹ / ₂	10 3	10 14	9 14	100 0	20 10	6 12	8 5	1 4
March -	1 9 ¹ / ₂	18 -	7 6	-	6 12	8 1 ¹ / ₂	10 2	10 8	8 10	100 0	19 1	6 0	9 8 ¹ / ₂	1 4

RUTNAGIRRI.

In the Month of	Rate of Exchange on London in Bombay. Sight Bills.	Value of China Gold Leaf per Tola in Bombay.	Wheat per Rupee.	Barley per Rupee.	Rice, Best Sort, per Rupee.	Rice, Common, per Rupee.	Jowar per Rupee.	Bajra per Rupee.	Gram per Rupee.	Firewood per Rupee.	Salt per Rupee.	Wheat Flour per Rupee.	Dall, Toor, per Rupee.	Ghee per Rupee.
1874:	<i>s. d.</i>	<i>Rs a.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>Bundles.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>	<i>s. ch.</i>
January -	1 10 ³ / ₄	16 12	10 1 ¹ / ₂	-	14 11	16 0	16 7	16 14	11 7	9	19 8	-	8 6	1 1 ¹ / ₂
February -	1 11 ¹ / ₈	16 11 ³ / ₄	-	-	-	15 9 ¹ / ₂	-	-	-	-	-	-	-	-
March -	1 11 ¹ / ₈	16 12 ¹ / ₄	11 6	-	14 4 ¹ / ₂	-	17 6	18 12	11 7	9	20 11	-	8 14	1 3
April -	1 11	17 -	-	-	-	-	-	-	-	-	-	-	-	-
May -	1 11	17 -	-	-	-	-	-	-	-	-	-	-	-	-
June -	1 10 ¹ / ₄	17 1	11 8	-	13 8	14 15	17 6	18 12	12 11	9	20 11	-	10 9	1 1 ¹ / ₂
July -	1 10 ¹ / ₄	17 1	10 7	-	12 0 ¹ / ₂	13 8	16 3	17 6	12 3	9	15 13	-	9 4 ¹ / ₂	1 9 ¹ / ₂
August -	1 10 ¹ / ₄	17 2 ¹ / ₄	10 3	-	11 6	14 4 ¹ / ₂	15 0	16 11 ¹ / ₂	13 0	10	15 8	-	9 4 ¹ / ₂	1 9 ¹ / ₂
September -	1 10 ³ / ₈	17 4	8 5 ¹ / ₂	-	-	-	-	-	-	-	-	-	-	-
October -	1 10 ³ / ₈	17 3 ¹ / ₄	10 15 ¹ / ₂	-	12 2	13 9 ¹ / ₂	15 0	16 3 ¹ / ₂	12 4 ¹ / ₂	10	13 0 ¹ / ₂	-	9 6	1 4 ¹ / ₂
November -	1 10 ³ / ₈	17 4	12 4 ¹ / ₂	-	11 13 ¹ / ₂	13 4 ¹ / ₂	-	17 4	12 5	8 ¹ / ₂	15 0	-	10 1	1 5 ¹ / ₂
December -	1 10 ³ / ₈	17 3	12 15	-	12 4 ¹ / ₂	13 0 ¹ / ₂	17 8	18 15	13 0	9	18 9	-	10 2	1 10 ¹ / ₂
1875:														
January -	1 10 ³ / ₈	17 3 ¹ / ₄	12 15	-	12 3	14 8	17 8	19 8	13 5 ¹ / ₂	9	18 4	9 11	10 12	1 12
February -	1 10 ³ / ₈	17 4	12 4 ¹ / ₂	-	12 3	15 6	20 0	18 13 ¹ / ₂	14 5	10	19 9	9 11	12 1	1 9 ¹ / ₂
March -	1 10	17 4 ³ / ₄	12 15	-	11 13 ¹ / ₂	14 8	18 12	18 3	15 0	10	20 14	9 11	11 6 ¹ / ₂	1 7
April -	1 10 ¹ / ₈	17 6 ³ / ₄	12 15	-	11 8	12 15	17 8	18 3	16 0 ¹ / ₂	10	20 14	9 11	10 12	1 7
May -	1 10	17 9 ¹ / ₄	10 15 ¹ / ₂	-	11 8	12 9	17 8	16 14	16 6	9	20 14	9 11	10 12	1 4
June -	1 9 ⁷ / ₈	17 10	9 10 ¹ / ₂	-	11 8	12 3	-	15 9	16 6	9	18 14 ¹ / ₂	8 5 ¹ / ₂	10 12	1 1
July -	1 9 ⁷ / ₈	17 9 ³ / ₄	8 6	-	11 8	12 3	-	15 9	16 6	9	17 9 ³ / ₄	6 10 ³ / ₄	10 12	1 1
August -	1 9 ⁷ / ₈	17 6	7 6 ¹ / ₂	-	11 8	12 15	-	15 9	16 6	9 ¹ / ₂	17 9 ³ / ₄	6 4	10 12	1 1
September -	1 9 ¹ / ₈	17 6	8 6	-	11 8	12 15	-	15 9	15 15	10 ¹ / ₂	18 4	6 4	10 12	1 1
October -	1 9 ¹ / ₈	17 5 ¹ / ₄	8 11	-	11 8	12 15	-	15 9	15 0	11	20 14	6 14	10 12	1 2 ¹ / ₂
November -	1 9 ¹ / ₈	18 8 ¹ / ₂	9 0 ¹ / ₂	-	11 8	13 4 ¹ / ₂	-	15 9	15 0	11	20 14	6 14	10 12	1 4
December -	1 9 ¹ / ₂	17 9	10 0	-	12 3	14 0	15 10	15 9	15 11	11	20 14	7 8	10 12	1 1
1876:														
January -	1 9 ¹ / ₂	17 10 ¹ / ₂	10 5	-	12 3	14 11 ¹ / ₂	15 0	15 9	17 0	11	20 14	7 8	10 12	1 1
February -	1 8 ⁷ / ₈	18 -	10 15 ¹ / ₂	-	11 13 ¹ / ₂	14 12	16 4	15 9	15 11	11	20 14	7 8	9 6	1 1
March -	1 8 ⁷ / ₈	18 7	10 15 ¹ / ₂	-	10 12	13 10	15 0	14 14 ¹ / ₂	15 0	11	20 14	7 2 ¹ / ₂	8 11	1 1
April -	1 8 ¹ / ₈	18 4 ¹ / ₂	10 5	-	10 6 ¹ / ₂	13 4 ¹ / ₂	14 6	14 4	15 0	11	19 9	7 3	8 11	1 1
May -	1 8 ¹ / ₈	18 8 ¹ / ₂	10 5	-	10 1	12 15	13 2	14 4	15 0	11	19 9	7 7	9 0 ¹ / ₂	1 1
June -	1 6 ¹ / ₈	19 -	10 5	-	10 1	12 15	-	12 5 ¹ / ₂	15 0	11	13 3	7 8	8 11	0 15 ¹ / ₂
July -	1 6 ¹ / ₈	19 13 ¹ / ₄	9 11	-	8 15 ¹ / ₂	11 14 ¹ / ₂	-	11 11	13 11	10	16 0 ¹ / ₂	7 8	8 11	0 12 ¹ / ₂
August -	1 7 ¹ / ₈	18 14 ¹ / ₂	9 1	-	8 10	11 8	-	11 11	13 0	11 ¹ / ₂	18 4	7 8	8 1	0 13 ¹ / ₂
September -	1 7 ¹ / ₈	19 1	9 1	-	8 15 ¹ / ₂	11 13 ¹ / ₂	-	11 11	14 5 ¹ / ₂	12	17 7 ¹ / ₈	7 8	8 6	0 14 ¹ / ₂
October -	1 8 ¹ / ₈	18 11 ¹ / ₂	8 11 ¹ / ₂	-	7 3	10 5	12 8	11 5 ¹ / ₂	12 15 ¹ / ₂	12	17 9 ³ / ₄	7 8	8 11	0 14 ¹ / ₂
November -	1 8 ¹ / ₈	18 5 ¹ / ₄	8 1	-	7 3	10 15	10 0	11 0	10 4	12	18 4	7 8	7 11 ¹ / ₂	0 15
December -	1 9 ¹ / ₈	17 14 ¹ / ₂	8 11 ¹ / ₂	-	7 3	10 12	11 14	11 0 ¹ / ₂	10 15	12	18 4	7 8	7 6	0 15
1877:														
January -	1 10	17 12 ¹ / ₄	9 1	-	7 8 ¹ / ₂	10 6 ¹ / ₂	11 4	11 11	11 10	12	18 4	7 8	7 13 ¹ / ₂	1 0
February -	1 9 ¹ / ₈	17 14	9 1	-	7 8 ¹ / ₂	10 1	11 4	11 11	12 5	12	18 5	7 8	8 6 ¹ / ₂	1 1
March -	1 9 ¹ / ₈	18 -	8 11 ¹ / ₂	-	7 14	10 1	11 4	11 11	11 10	12	18	7 8	8 1	1 1

Statement E—continued.

No 18.

PRICES CURRENT OF FOOD GRAINS, &c. at Kanara (Carwar) from January 1874 to March 1877, with the Average RATE OF EXCHANGE and of the Value of GOLD LEAF.

KANARA—(CARWAR).

In the Month of	Rate of Exchange on London in Bombay. Slight Bills.	Value of China Gold Leaf per Tola in Bombay.	Wheat per Rupee.	Barley per Rupee.	Rice, Best Sort, per Rupee.	Rice, Common, per Rupee.	Jowar per Rupee.	Bajra per Rupee.	Gram per Rupee.	Firewood per Rupee.	Salt per Rupee.	Wheat Flour per Rupee.	Dall, Toor, per Rupee.	Ghee per Rupee.
1874:														
January	s. d. 1 10 ³ / ₄	Rs. a. 16 12	s. ch. 11 10	-	s. ch. 14 4	s. ch. 18 9 ¹ / ₂	s. ch. 16 1 ¹ / ₂	s. ch. 20 0	s. ch. 10 4 ¹ / ₂	s. ch. 198 14	s. ch. 12 13	s. ch. 7 8	s. ch. 7 7	s. ch. 1 3
February	1 11 ¹ / ₄	16 11 ¹ / ₂	12 8	-	13 12	18 0	16 0	18 8	11 0	213 0	16 0	8 0	9 0	1 4 ¹ / ₂
March	1 11 ¹ / ₄	16 12 ¹ / ₄	13 0	-	14 0	19 0	17 4	19 0	11 0	213 0	14 8	8 0	9 0	1 4 ¹ / ₂
April	1 11	17 -	13 0	-	14 0	18 0	16 0	18 0	11 0	213 0	13 0	8 8	9 0	1 3
May	1 10 ³ / ₄	17 1	13 0	-	15 0	19 8	16 0	19 8	12 0	213 0	10 8	9 0	9 8	1 1 ¹ / ₂
June	1 10 ³ / ₄	17 1 ¹ / ₂	13 4	-	14 8	20 0	16 0	19 8	12 0	213 0	13 8	9 0	10 0	1 1 ¹ / ₂
July	1 10 ³ / ₄	17 2 ¹ / ₄	13 8	-	14 0	20 0	16 0	20 0	12 8	213 0	14 8	7 8	10 0	1 0
August	1 10 ³ / ₄	17 4	13 8	-	12 8	19 0	16 0	20 0	12 8	213 0	12 0	8 8	10 0	1 0
September	1 10 ³ / ₄	17 3 ¹ / ₄	14 0	-	13 0	19 0	16 0	19 0	12 0	213 0	13 0	8 8	10 0	1 5
October	1 10 ³ / ₄	17 4	13 8	-	13 8	18 0	16 0	19 0	12 0	213 0	13 0	9 0	10 0	1 7
November	1 10 ³ / ₄	17 3	13 8	-	13 8	18 0	16 0	19 0	12 0	213 0	14 8	9 0	12 0	1 5
December	1 10 ³ / ₄	17 3	13 8	-	13 8	18 0	16 0	19 0	12 0	213 0	14 8	9 0	12 0	1 7
1875:														
January	1 10 ³ / ₄	17 3 ¹ / ₄	13 8	-	14 8	19 0	16 0	19 0	13 0	213 0	14 8	9 0	11 8	1 9 ¹ / ₂
February	1 10 ³ / ₄	17 4	14 0	-	15 0	19 0	16 0	19 0	13 0	213 0	16 0	9 0	12 0	1 10
March	1 10 ³ / ₄	17 4 ³ / ₄	13 0	-	15 0	16 0	16 0	16 0	13 0	213 0	14 8	9 0	13 8	1 8 ¹ / ₂
April	1 10 ³ / ₄	17 6 ³ / ₄	13 8	-	13 8	16 0	16 0	16 0	14 0	213 0	13 0	8 14	13 0	1 7
May	1 10 ³ / ₄	17 9 ³ / ₄	14 0	-	13 8	16 0	16 0	16 0	14 0	213 0	13 0	8 12 ¹ / ₂	14 0	1 5
June	1 9 ¹ / ₄	17 9 ³ / ₄	14 0	-	12 0	16 0	16 0	16 0	13 0	213 0	13 8	8 4 ³ / ₄	13 8	1 5
July	1 9 ¹ / ₄	17 9 ³ / ₄	14 0	-	11 8	15 4	16 0	16 7	13 0	213 0	13 0	8 12 ¹ / ₂	13 8	1 5
August	1 9 ¹ / ₄	17 7 ³ / ₄	13 0	-	11 8	14 0	15 4	16 0	11 8	213 0	13 0	8 12	13 0	1 5
September	1 9 ¹ / ₄	17 6	13 0	-	12 0	13 0	14 0	13 0	13 0	213 0	13 0	8 12	13 0	1 5
October	1 9 ¹ / ₄	17 5 ¹ / ₄	13 8	-	13 0	14 0	16 0	14 0	14 8	213 0	13 0	8 12	13 0	1 5
November	1 9 ¹ / ₄	18 8 ¹ / ₄	13 8	-	14 0	14 0	17 8	14 0	14 0	213 0	13 0	8 12	14 0	1 2
December	1 9 ¹ / ₄	17 9	13 0	-	14 8	16 0	18 0	16 0	15 8	213 0	13 0	8 12	14 0	1 2
1876:														
January	1 9 ¹ / ₄	17 10 ¹ / ₄	13 8	-	15 0	15 0	18 0	15 0	16 0	213 0	14 0	8 12	14 0	1 2
February	1 8 ⁹ / ₄	18 -	13 0	-	15 0	15 0	18 0	15 0	16 0	213 0	14 0	8 4	14 0	1 2
March	1 8 ⁹ / ₄	18 7 ¹ / ₄	13 0	-	14 0	14 8	17 8	14 8	16 0	213 0	13 8	8 4	13 8	1 4 ¹ / ₂
April	1 8 ⁹ / ₄	18 4 ¹ / ₄	13 0	-	12 10	14 0	18 0	14 0	16 0	213 0	13 8	8 12	12 12	1 5
May	1 8 ⁹ / ₄	18 8 ¹ / ₄	13 0	-	12 8	14 0	18 0	14 0	16 0	213 0	13 0	8 12	12 0	1 4
June	1 8 ⁹ / ₄	19 2 ¹ / ₄	13 0	-	12 0	13 0	17 8	13 0	16 0	213 0	13 0	8 12	12 0	1 4
July	1 6 ³ / ₄	19 13 ¹ / ₄	13 0	-	11 8	13 0	16 0	13 0	16 0	213 0	10 10	8 12	12 0	1 4
August	1 7 ¹ / ₄	18 14 ¹ / ₄	13 0	-	12 0	14 0	16 0	14 0	15 0	213 0	13 0	8 12	13 0	1 3
September	1 7 ¹ / ₄	19 1	13 0	-	12 8	14 0	16 0	14 0	16 0	213 0	11 12	7 13	13 0	1 3
October	1 7 ¹ / ₄	18 11 ¹ / ₄	11 8	-	12 0	13 8	14 0	13 8	13 0	213 0	13 0	7 13	13 0	1 0 ¹ / ₂
November	1 8 ¹ / ₄	18 5 ¹ / ₄	10 0	-	12 0	11 8	11 0	11 8	13 0	213 0	12 8	6 14 ¹ / ₂	11 8	1 1 ¹ / ₂
December	1 9 ¹ / ₄	17 1 ¹ / ₄	10 8	-	12 0	10 0	12 0	10 0	12 0	213 0	13 0	6 4	9 0	1 1
1877:														
January	1 10	17 12 ¹ / ₄	10 4	-	10 12	10 8	12 0	10 8	11 8	213 0	13 0	6 8 ¹ / ₂	9 0	1 1 ¹ / ₂
February	1 9 ¹ / ₄	17 1 ¹ / ₄	11 0	-	11 0	11 0	12 0	11 0	11 8	213 0	13 0	6 13	10 0	1 1
March	1 9 ¹ / ₄	18 -	11 0	-	11 0	11 0	11 8	11 0	11 8	213 0	13 0	7 5	12	1 1

PUNCH MAHALS—(GODHRA).

In the Month of	Rate of Exchange on London Bombay. Sight Bills.	Value of China Gold Leaf per Tola in Bombay.	Wheat per Rupee.	Barley per Rupee.	Rice, Common, per Rupee.	Jowar per Rupee.	Bajra per Rupee.	Gram per Rupee.	Flewood per Rupee.	Salt per Rupee.	Wheat Flour per Rupee.	Dall, Toor, per Rupee.	Ghee per Rupee.
1874:	s. d.	Rs. a.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.
January -	1 10 ³ / ₄	16 12 ³ / ₄	10 4	8 0	12 12	28 0	21 8	17 12	200 0	12 4	8 0	10 0	1 6
February -	1 11 ¹ / ₄	16 11 ³ / ₄	10 4	9 0	12 8	28 0	26 0	23 0	200 0	12 0	9 8	9 8	1 9 ¹ / ₄
March -	1 11 ¹ / ₄	16 12 ³ / ₄	10 4	9 0	12 8	28 0	26 0	24 0	200 0	14 0	10 0	11 0	1 9 ¹ / ₄
April -	1 11	17 - 3 ⁴ / ₄	10 0	9 0	12 0	27 0	26 0	24 0	200 0	14 0	10 0	11 0	1 9 ¹ / ₄
May -	1 10 ³ / ₄	17 1	10 8	9 0	12 0	25 0	24 0	23 0	200 0	14 0	10 8	10 8	2 0
June -	1 10 ³ / ₄	17 1 ¹ / ₄	12 0	9 0	12 0	25 0	25 0	21 8	200 0	14 0	10 0	10 0	2 0
July -	1 10 ³ / ₄	17 2 ¹ / ₄	12 0	9 0	12 0	29 0	25 0	21 8	200 0	14 0	9 0	10 0	2 0
August -	1 10 ³ / ₄	17 4	11 0	9 0	12 0	29 0	25 0	21 0	200 0	14 0	9 0	10 0	2 0
September -	1 10 ³ / ₄	17 3 ⁴ / ₄	11 0	9 0	12 0	29 0	25 0	21 0	200 0	13 0	9 0	10 0	2 0
October -	1 10 ³ / ₄	17 3 ⁴ / ₄	10 0	9 0	12 0	35 0	27 0	21 0	200 0	13 0	9 0	10 0	2 0
November -	1 10 ³ / ₄	17 4	10 0	9 0	12 0	35 0	27 0	21 0	200 0	13 0	9 0	10 0	2 0
December -	1 10 ³ / ₄	17 3	10 0	9 0	12 0	35 0	27 0	21 0	200 0	13 0	9 0	10 0	2 0
1875:	s. d.	Rs. a.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.
January -	1 10 ³ / ₄	17 9 ¹ / ₄	11 0	11 8	13 8	35 0	27 0	21 0	200 0	13 0	9 0	11 0	2 0
February -	1 10 ³ / ₄	17 4	12 0	11 0	15 0	28 0	27 0	21 0	200 0	13 0	10 0	12 0	2 0
March -	1 10 ³ / ₄	17 4 ³ / ₄	12 8	11 0	15 0	27 0	27 0	30 0	200 0	13 8	10 8	13 0	2 0
April -	1 10 ³ / ₄	17 6 ³ / ₄	13 0	11 0	15 0	27 0	26 0	30 0	200 0	14 0	11 0	14 0	2 0
May -	1 10	17 10 ³ / ₄	13 0	11 0	15 0	28 0	25 0	30 0	200 0	14 0	11 0	15 0	1 8
June -	1 9 ⁷ / ₄	17 10	12 8	11 0	13 8	26 0	19 0	32 0	200 0	14 0	11 7 ¹ / ₄	15 0	1 0
July -	1 9 ⁷ / ₄	17 9 ³ / ₄	12 0	11 0	13 0	25 0	18 8	32 0	200 0	13 0	10 10 ¹ / ₄	15 0	1 2 ¹ / ₄
August -	1 9 ⁷ / ₄	17 7 ³ / ₄	11 0	11 0	13 0	25 0	19 0	31 0	200 0	13 0	9 5	15 0	1 5
September -	1 9 ³ / ₄	17 6	11 0	11 0	13 0	25 0	19 0	30 0	200 0	13 0	9 5	15 0	1 5
October -	1 9 ³ / ₄	17 5 ¹ / ₄	11 0	11 0	13 0	30 0	19 0	30 0	200 0	13 0	9 5	15 0	1 5
November -	1 9 ³ / ₄	18 8 ¹ / ₄	11 0	11 0	13 0	35 0	19 0	30 0	200 0	13 0	9 5	20 0	1 5
December -	1 9 ³ / ₄	17 9	11 0	11 0	14 0	35 0	21 8	30 0	200 0	14 0	9 10 ¹ / ₄	21 0	1 5
1876:	s. d.	Rs. a.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.
January -	1 9 ¹ / ₄	17 10 ¹ / ₄	12 0	11 0	15 0	35 0	23 0	30 0	200 0	15 0	10 5	22 0	1 5
February -	1 8 ³ / ₄	18 - 1 ¹ / ₄	11 0	12 0	15 0	33 0	23 0	30 0	200 0	14 0	10 0	22 0	1 5
March -	1 8 ³ / ₄	18 7	11 0	12 0	15 0	33 0	23 0	30 0	200 0	14 0	10 0	23 0	1 5
April -	1 8 ¹ / ₄	18 4 ¹ / ₄	11 0	12 0	15 0	33 0	23 0	30 0	200 0	14 0	10 0	24 0	1 5
May -	1 8 ³ / ₄	18 8 ³ / ₄	11 0	12 0	15 0	33 0	23 0	30 0	200 0	14 0	10 0	24 0	1 5
June -	1 7 ³ / ₄	19 - 3 ⁴ / ₄	11 0	12 0	15 0	33 0	23 0	30 0	200 0	14 0	10 0	24 0	1 5
July -	1 6 ³ / ₄	19 13 ¹ / ₄	11 0	12 0	15 0	33 0	23 0	30 0	200 0	14 0	10 0	24 0	1 5
August -	1 7 ¹ / ₄	18 14 ¹ / ₄	10 0	12 0	15 0	33 0	23 0	31 0	200 0	14 0	9 0	24 0	1 5
September -	1 7 ¹ / ₄	19 1	10 0	12 0	15 0	33 0	23 0	31 0	200 0	14 0	9 0	24 0	1 5
October -	1 8 ¹ / ₄	18 11 ¹ / ₄	10 0	12 0	15 0	33 0	23 0	31 0	200 0	14 0	9 0	24 0	1 5
November -	1 8 ³ / ₄	18 5 ¹ / ₄	9 0	10 0	13 0	22 8	16 0	22 8	200 0	14 0	8 0	16 0	1 2
December -	1 9 ³ / ₄	17 14 ¹ / ₄	9 0	10 0	13 0	22 8	16 0	22 8	200 0	14 0	8 0	16 0	1 3 ¹ / ₄
1877:	s. d.	Rs. a.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.	s. ch.
January -	1 10	17 12 ¹ / ₄	9 0	10 0	13 0	21 4	16 0	22 8	200 0	14 0	8 0	14 10	1 2
February -	1 9 ³ / ₄	17 14	9 0	9 8	12 0	20 0	15 4	20 12	200 0	14 0	8 0	12 6	1 2
March -	1 9 ³ / ₄	18 -	9 0	9 0	11 0	20 0	14 8	19 0	200 0	14 0	8 0	10 12	1 2

EAST INDIA (SILVER).

COPY of a LETTER from the GOVERNMENT of INDIA,
forwarding Reports by the BENGAL and BOMBAY
CHAMBERS of COMMERCE, regarding the effects in
the Fall in the Price of SILVER on Trade and
Remittances, and on Prices in INDIA.

'Lord George Hamilton.)

*Ordered, by The House of Commons, to be Printed,
11 August 1877.*

RETURN to an Address of the Honourable The House of Commons,
dated 13 April 1877;—for,

- “ COPIES of DESPATCHES to *India*, Nos. 97 of the 29th day of April 1869, and 144 of the 8th day of December 1870 :”
- “ Of LETTERS from *India*, Nos. 262 of the 21st day of December 1870, and 88 of the 23rd day of May 1871 :”
- “ Of DESPATCHES to *India*, Nos. 30 of the 2nd day of March, and 113 of the 6th day of September 1871 :”
- “ Of a LETTER from the Under Secretary to the Government of *India*, Foreign Department, to the Officiating Chief Commissioner of *British Burmah*, No. 1178 P. of the 4th day of June 1873, and of REPLY thereto, No. 308.6 P. of the 19th day of June 1873 :”
- “ And, of LETTERS from the Secretary to the Government of *India*, Foreign Department, to Her Majesty’s Minister at the Court of *Pekin*, No. 1064 P. of the 26th day of May, and No. 1437 P. of the 2nd day of July 1873.”

(In continuation of Parliamentary Paper, C. 1456, of Session 1876).

India Office, }
April 1877. }

GEORGE HAMILTON,
Under Secretary of State.

POLITICAL DESPATCH to *India*, dated 29th April 1869, No. 97.

1. I HAVE maturely considered in Council the letter of Your Excellency’s Government, dated 3rd October, No. 166 of 1868, in the Foreign Department, with the enclosed correspondence, relating to a proposed survey of the country lying between Tounghoo, in British Burmah, and Kiang Hung, on the Cambodia River.

2. Her Majesty’s Government are desirous of promoting any measure which may have the ultimate effect of facilitating intercourse between India and China, with a view to the interchange of mercantile commodities and the development of the resources of the two countries; and they are anxious to advance, by such explorations as are here suggested, the interests of geographical science.

3. The settlement of the present question is regarded with considerable interest by large and important mercantile communities in this country, and I should be glad therefore if the proposal now before me, which has the support of Colonel Fytche, the Chief Commissioner of British Burmah, could be carried into effect, provided that the necessary operations of the survey can be undertaken without entailing upon your Government any embarrassment or inconvenience in the shape of political complications, and if they should not involve any undue expenditure of the public money.

4. With respect to the latter point, I should wish to receive from you some estimate of the probable expense.

(signed) *Argyll.*

POLITICAL DESPATCH to *India*, dated 8th December (No. 144) 1870.

1. I HAVE to bring to the notice of Your Excellency's Government that no reply has as yet been received to the last paragraph of my Despatch, No. 97 of 29th April 1869, requesting you to furnish me with an estimate of the probable expense of a survey of the country lying between Tounghoo, in British Burmah, and Kiang Hung, on the Cambodia River.

2. I desire to be supplied at your earliest convenience with the requisite information on this point, together with an expression of the opinion of your Excellency's Government as to the expediency or otherwise of continuing the survey of this route between Burmah and China.

(signed) *Argyll.*

(Extract).

No. 262 of 1870.

Government of India, Foreign Department.—Political.

To His Grace the Duke of *Argyll*, K.T., Her Majesty's Secretary of State for India.

My Lord Duke, Fort William, 21 December 1870.

IN Despatch, No. 101, dated 22nd September last, your Grace transmitted to us, "for consideration," a memorandum by Captain R. Sprye, the advocate of the Rangoon and Kiang Hung route, reviewing the various proposed lines of communication between India and China, and commenting on certain statements contained in the memorandum by Major General Fytche on Major Sladen's confidential report.

2. The reasons which induced Lord Lawrence's Government to recommend, and Sir S. Northcote to sanction, the stoppage of the experimental survey of the line of country through which the projected railway from Rangoon to Kiang Hung would run, are very fully set forth in the papers which accompanied Despatch, No. 133, dated 15th August 1867, in the Public Works Department. They showed that on the British side of the frontier some physical difficulties would have to be overcome, though they did not appear to be extraordinary or formidable; that whether the difficulties of the same nature in the country beyond the British frontier were greater or less, at all events the political difficulties were of the gravest character; that the railway would for a considerable part of the distance have to be constructed by labourers imported at great expense from Madras; that it would be therefore a very costly undertaking, and would probably involve a severe loss of life among the labourers; in fine, that this scheme ought not to receive the support of the Government of India at the present time, and that, whatever be its merits, it was brought forward a generation too soon.

3. For these, as well as for financial reasons, Her Majesty's Government stated their opinion in the Despatch No. 111, dated 31st October 1867, that it would at that time be out of the question to render pecuniary aid for the promotion of the enterprise, however favourably it might be reported on. We have attentively perused Captain Sprye's present memorandum, but have failed to perceive that it advances any fresh arguments which should lead to a reconsideration, at the present time, of the scheme which the Government in India and Her Majesty's Government at home considered it to be the most prudent course to suspend in 1867. Nor can we perceive that there is anything in the substance of General Fytche's remarks, as to the present impracticability of any railway in the direction advocated by Captain Sprye, that is not fully borne out by facts.

4. Those remarks, and the arguments on which they are based, apply to the scheme with equal force, whether it was intended to carry the line only as far as the Cambodia River, or to push it on into Southern China.

* * * * *

(signed) *Mayo,*
&c. &c.

(Extract.)

POLITICAL DESPATCH to *India*, dated 2nd March (No. 30) 1871.

1. I HAVE had under my attentive consideration in Council the Foreign letter of Your Excellency's Government, No. 262, of the 21st December 1870, relative to the representations of Captain Sprye for the resumption of the survey between Rangoon and Kiang Hung, the discontinuance of which was, on your strong recommendation, sanctioned by my predecessor, Sir Stafford Northcote, in his Despatch, No. 111, of the 31st October 1867.

2. You are of opinion that the apprehended political difficulty, which formed a prominent ground for discontinuing the exploration, still exists in the same degree as before; and I am constrained to agree with you that, in a financial point of view, the present time is little, if at all, more propitious for the resumption of the undertaking than that in which those paragraphs were penned.

3. In these circumstances Her Majesty's Government acquiesce in the opinion expressed by you in the letter under reply.

* * * * *

(signed) *Argyll.*

No. 88, of 1871.

Government of India, Foreign Department.—Political.

To His Grace the Duke of *Argyll*, K.T., Her Majesty's Secretary of State for India.

My Lord Duke,

Simla, 23 May 1871.

WE have the honour to acknowledge the receipt of your Grace's Despatches, marginally noted, calling for an estimate of the cost of continuing the survey of the country between Tounghoo, in British Burmah, and Kiang Hung, on the Cambodia River, and for an expression of our opinion as to the expediency or otherwise of the measure.

2. On the latter point we beg to invite the attention of your Grace to our Despatches, noted in the margin. Nothing has occurred since these Despatches were written to induce us to change our opinion as to the inexpediency at present of entering upon a survey of the country referred to.

3. From the Despatches already quoted, your Grace will observe that, at a rough calculation, the cost of the entire survey was estimated at one lakh of rupees. For the preliminary survey of the portion of the line in British territory, the establishment sanctioned by us was 4,234 rupees a month, and the operations occupied three months, thus costing 12,702 rupees. It was then estimated that the work could not be completed in less than one whole season of seven months, and might perhaps occupy more than two seasons. Allowing that the work could be done in 12 months, the cost at the same rate would be 50,808 rupees; but as the operations would be in a foreign country, a considerably heavier expenditure might be looked for. To the above sum would have to be added the salary of a political officer to accompany the expedition, at 2,500 rupees a month, which would make a total expenditure of not less, and probably more, than 80,808 rupees for two seasons of six months each.

We have, &c.
(signed) *Mayo*,
&c. &c.

No. 97, dated
29 April 1869.
No. 144, dated
8 December 1870.

No. 197, dated
8 December 1866.
No. 133, dated
15 August 1867, in
the Public Works
Department.
No. 166, dated
3 October 1868.

POLITICAL DESPATCH to *India*, dated 6th September (113) 1871.

1. I HAVE had under attentive consideration in Council the Foreign letter of Your Excellency's Government, No 88, of the 23rd May 1871, relative to the expediency, and probable cost, of completing the survey of the country between Tounghoo and Kiang Hung.

2. You report your unchanged opinion that the resumption of the survey is at present inexpedient, while you estimate the cost at little less than a lakh of rupees.

3. In these circumstances, Her Majesty's Government have no sufficient reason for urging on you the resumption of the undertaking.

(signed) *Argyll.*

(Extract.)

From Secretary to the Government of India, Foreign Department, to Her Majesty's Minister at *Pekin* (No. 1064 P.), dated Simla, 26th May 1873.

I AM directed to acknowledge receipt of your letter to His Excellency the Viceroy and Governor General, dated 27th February last, relative to the recapture of Talifu by the Chinese, and the re-establishment of the Imperial Government in the province of Yunan.

* * * Should the intelligence contained in your letter under acknowledgment prove authentic, His Excellency in Council will be glad if you would ascertain, as soon as it may appear desirable to do so, whether there is any prospect of the Chinese Government being induced to open out trade through the province of Yunan.

From Under Secretary to the Government of India, Foreign Department, to Officiating Chief Commissioner, *British Burmah* (No. 1178 P.), dated Simla, 4th June 1873.

IN acknowledging the receipt of your letter (No. 199-6 P.), dated 3rd May 1873, forwarding the diary of the Assistant Political Agent, Bhamo, from the 3rd to 15th April 1873, I am directed to inquire whether the country is now open for trade between Upper Burma and China, and what prospects there are of regular communications being established.

From Officiating Secretary to the Chief Commissioner, *British Burmah*, to Secretary to the Government of India, Foreign Department (No. 308-6 P.), dated Rangoon, 19th June 1873.

I AM directed to acknowledge receipt of your letter (No. 1178 P.) of the 4th instant, inquiring whether the country is now open for trade between Upper Burmah and China, and what prospects there are of regular communication being established.

2. In reply, I am to say that from the tenour of the latest diaries received from the Political Agent at Bhamo, it does not appear that the route from that station to the Chinese province of Yunan is by any means in a safe condition for travellers. The town of Momein, which is the most westerly town of importance held by the Panthays, is still in the hands of the Mahomedans, although apparently surrounded by the Chinese army.

3. Meanwhile the Khakyens, who hold the hill passes, appear to be in a very disturbed state, and Captain Lowndes' diaries, from the 16th April to the 19th May, mention several instances of their plundering the Shans and others while crossing the hills.

4. In

4. In regard to the future prospects of the routes from Bhamo to Yunan, it is probable that it will very much depend on the course the Chinese may pursue whether greater security will prevail. If they entirely crush the Mahomedan population, and maintain a strong provincial authority in Yunan, there need be no great difficulty in establishing a satisfactory trade route; but while desultory fighting goes on, and Chinese supremacy is not completely ensured, the roads will continue in a very insecure condition.

5. The Chief Commissioner has called on the Political Agent, Mandalay, to report fully on the present condition and future prospects of the routes in question.

6. If such pressure could be brought to bear on the Chinese Government as would induce them to maintain a regular line of guarded stations between Bhamo and Yunan, or Talifoo even, the trade would develop at once.

From Secretary to the Government of India, Foreign Department, to Her Majesty's Envoy Extraordinary, and Minister Plenipotentiary at the Court of Peking (No. 1437 P.), dated Simla, 2nd July 1873.

WITH reference to the correspondence ending with my letter, No. 1664 P., dated 26th May last, I am directed by His Excellency the Viceroy and Governor General in Council to inform you that the Government of India has learned, through British Burmah, that it may be accepted as a fact that Talifoo has fallen. Both Chinese and Panthays are agreed in this. It is further stated that Sultan Suliman has been decapitated, and that his head has been forwarded to Peking preserved in honey.

Three of the Sultan's young sons have, it is also said, been sent to Peking.

The slaughter at Talifoo appears, from all accounts, to have been very great, and some 60,000 or 80,000 Mussulmans are reported as slain. The only two towns remaining at the end of April in possession of the Panthays were Momein and Yuichow, and both of these were expected to succumb shortly.

The Chinese general has since reported to the King of Bhamo that Momein was captured on the 30th May with great slaughter, and that Tahsakon was taken prisoner. The Governor of Yunan has addressed a letter to the King of Burmah, expressing a wish that the trade route might be opened without delay.

EAST INDIA (TRADE WITH WESTERN CHINA).

COPIES of DESPATCHES to *India*, of 29 April 1869, and 8 December 1870; of LETTERS from *India*, of 21 December 1870, and 23 May 1871; of DESPATCHES to *India*, of 2 March, and 6 September 1871; of a LETTER from the Under Secretary to the Government of *India*, Foreign Department, to the Officiating Chief Commissioner of *British Burmah*, of 4 June 1873, and of REPLY thereto; and, of LETTERS from the Secretary to the Government of *India*, Foreign Department, to Her Majesty's Minister at the Court of *Peking*, of 26 May and 2 July 1873.

(In continuation of Parliamentary Paper, C. 1456, of Session 1876).

(Sir Wilfrid Lawson.)

Ordered, by The House of Commons, to be Printed,
20 April 1877.

170.

Under 1 oz.

RETURN of Cost, Tonnage, Power and Consumption of COAL, also Expense of Service of the TROOP SHIPS "CROCODILE," "EUPHRATES," "JUMNA," "MALABAR," and "SERAPIS" (in continuation of Parliamentary Paper, No. 119—I. of Session 1876), for the Year 1875-76.

India Office,
7 June 1877.

GEORGE HAMILTON,
Under Secretary of State for India.

INDIAN TROOP SERVICE.

The Director of Transport Services to the Under Secretary of State,
India Office.

Sir,

Admiralty, S.W., 15 May 1877.

I BEG to transmit, for the information of the Secretary of State for India in Council, and for presentation to the House of Commons, should he be pleased so to determine, a return of the cost, tonnage, &c., of Her Majesty's Indian Troop Ships, and of the cost of conducting the Indian Troop Service, during the season 1875-76, together with a statement of the services performed by the ships during that season, and a summary of their services during the nine seasons which have passed since the annual reliefs have been conveyed *via* Egypt. This return has been prepared in the same form as those for previous years, which were ordered by precept.

2. The season was an exceptional one, inasmuch as the "Serapis" was lent for the greater part of the year in connection with the visit of His Royal Highness the Prince of Wales to India, and the expense for pay and provisions of the crew which would have been borne by Indian Revenues, had she remained in the "Reserve," was consequently saved; in other respects the season corresponded generally with that of 1874-75,—four ships being employed and 16 voyages being made in each season, and the distance run and the speed maintained being about the same. The total number conveyed was, however, less than in 1874-75, the accommodation of the ships not being fully utilised, as set forth in my letter of the 31st July last. This circumstance tended to counterbalance the benefit derived financially from the temporary transfer of the "Serapis" to the Admiralty. The voyages were made within the time provided for by the programme of movements; there was no delay, and no casualty of any kind occurred to the ships.

3. The following Tables show the numbers conveyed, the work performed, the average length of voyage, and the deaths during the three seasons, 1873 74 to 1875-76:—

	Number of Ships Employed.	Number of Voyages Made.	Number of Officers, Troops, and Families Conveyed.	Distance Run, Knots.	Average Number Conveyed on each Voyage (Adults).
1873-74	5	18	21,409	113,042	1,111
1874-75	4	16	20,629	97,454	1,201
1875-76	4	16	19,872	97,455	1,157

	OUTWARD VOYAGES.			HOMEWARD VOYAGES.		
	Average Duration.			Average Duration.		
	From Portsmouth or Queenstown to Port Said, and from Suez to Bombay.	In Passage of Canal.	TOTAL.	From Bombay to Suez, and Port Said to Portsmouth.	In Passage of Canal.	TOTAL.
	<i>Days. hours.</i>	<i>Days. hours.</i>	<i>Days. hours.</i>	<i>Days. hours.</i>	<i>Days. hours.</i>	<i>Days. hours.</i>
1873-74 -	31 2	1 18	32 20	32 2	1 16	33 18
1874-75 -	31 18	1 23	33 17	31 12	1 13	33 1
1875-76 -	30 12	1 16	32 4	30 21	1 14	32 11

DEATHS ON OUTWARD VOYAGES.

	Men.	Women.	Children.	TOTAL.	Rate per Cent. on Numbers Embarked.
1873-74 - - -	7	1	11	19	0·15
1874-75 - - -	9	1	21	31	0·30
1875-76 - - -	2	—	11	13	0·12

DEATHS ON HOMEWARD VOYAGES.

	Men.	Women.	Children.	TOTAL.	Rate per Cent. on Numbers Embarked.
1873-74 - - -	25	4	16	45	0·41
1874-75 - - -	37	2	18	57	0·53
1875-76 - - -	21	3	15	39	0·39

4. As regards expense, the total cost and the average rate per adult are considerably lower than those of any other season since the establishment of the service. The following Table gives the particulars during each of the last three years :—

	Working Expenses (Payments from Indian Revenues).		Capital Charges (not Payments).		TOTAL.	
	Amount.	Rate.	Amount.	Rate.	Amount.	Rate.
	£.	£. s. d.	£.	£. s. d.	£.	£. s. d.
1873-74 - - -	342,969	17 3 1	99,604	4 19 8	442,573	22 2 9
1874-75 - - -	309,122	16 1 9	73,423	3 16 5	382,545	19 18 2
1875-76 - - -	235,371	12 14 2	83,399	4 10 1	318,770	17 4 3

As compared with the season 1873-74, this shows a reduction in the rate per adult of 4*l.* 8*s.* 11*d.* on the payments from Indian Revenues, and of 4*l.* 18*s.* 6*d.* on the total of payments and capital charges, and as compared with the season 1874-75 a reduction of 3*l.* 7*s.* 7*d.* on payments, and 2*l.* 13*s.* 11*d.* on total payments and capital charges.

5. This

5. This result, which I submit may be considered satisfactory, is brought about principally by a reduction in nearly all the various items into which the expenditure is divided, viz. :—

Item 18. Wear and Tear of Hull, Engines and Stores.—This item may be divided into—

(A.)—Repairs of hull and engines, and repairs and renewal of stores.

(B.)—Repairs and renewal of saloon and cabin furniture, of lamps and lanterns, and of mess articles.

The expenditure under these heads during 1874-75 and 1875-76 was as follows :—

	1874-75.	1875-76.
	£.	£.
(A.)—Hull, engines, &c. - - - -	100,737	57,166
(B.)—Furniture, lamps, and mess articles -	1,510	2,054
£.	102,247	59,220

The reduction on hull, engines, &c., amounts to about 43,000 *l.*, but to enable a correct comparison to be made between the two years it is necessary to exclude the “*Serapis*,” as she was not employed on troop service, but lent to the Admiralty,—first observing that the expenditure on that ship in 1874-75 (35,855 *l.*) included a large sum for new boilers, and that the 7,136 *l.* spent in 1875-76 consisted principally of work done at the end of the previous season, and before she was transferred to the Admiralty. To ascertain the ordinary expenditure on the other ships it is requisite to deduct also 18,000 *l.* paid during the year towards the new engines fitted to “*Euphrates*.” This will leave the ordinary expenditure on the four ships as 32,030 *l.*, being at the rate of $3\frac{2}{3}$ per cent. per annum on the first cost of the ships, against $3\frac{2}{3}$ per cent. in 1874-75 and $4\frac{1}{2}$ per cent. in 1873-74.

The increase of expenditure on furniture, lamps, and mess articles may be accounted for by large repairs being required in consequence of the increased age of the articles, and by large outlay being necessary to replace articles worn out.

Item 19. Cost of Coal consumed.—The reduction of 3,734 *l.* is caused by the average cost and the quantity consumed being less than in 1874-75. The quantity and cost of coal consumed during the two seasons was as follows :—

	1874-75.	1875-76.
	Tons.	Tons.
Total quantity of coal consumed during the year (excluding that used for culinary purposes, charged to Item 20)	20,129	19,618
Ditto steaming only	17,505	16,930
	Knots.	Knots.
Knots run	97,454	97,455
	£. s. d.	£. s. d.
Cost of coal (total quantity)	33,090 - -	29,356 - -
Average cost per ton	1 12 10	1 9 11
	Knots.	Knots.
Knots run per ton of coal (steaming only)	5.57	5.76

The reduction in consumption may be attributed principally to the ships having run for the first time during the entire season at an average speed of 249. eight

eight knots between Suez and Bombay to the whole of the coal being Welsh, to the greater part of it being new, of good quality, and in good condition, and to improved management on board the ships.

The "Euphrates" was the only ship which drew coal at Bombay, the "Malabar" and "Jumna" (as in the previous season) and the "Crocodile" (for the first time) having run from Port Said to Bombay and back without coaling.

Item 20. Cost of Victualling Troops.—This item shows a reduction of 3,015*l.*, caused partly by the diminution of numbers conveyed, but principally by a saving of 6*d.* per head per diem in the cost of messing officers and their families.

Item 21. Bedding for Troops, Women, and Children.—The expenditure under this head continues very moderate, being at the rate of 1*s.* 2*d.* for each adult conveyed. The reduction of 297*l.* arises chiefly from less expense being incurred at Bombay.

Item 22. Cost of Victualling Ship's Company.—

Item 23. Officers' and Men's Pay and Allowances.— } Under these heads there is a net saving of 5,376*l.*,—a reduction of 11,936*l.* arising principally from the "Serapis" not being in commission, and from a saving in the cost of mess of officers,—an increase of 6,560*l.* from the arrangement coming into force by which Indian funds are charged with seven-twelfths of the wages and victualling of the men borne in the reserves during the non-trooping season.

Item 28. Transit Charges in Egypt.—

Item 29. Wages, Coals, &c., of Steam Tenders in Egypt.— } The differences in expenditure under these heads are trifling.

Item 30. Expenses of Embarking and Disembarking Troops at Bombay (formerly inserted as Wages, Coals, &c., for Tugs and Boats).—The difference on this item, 659*l.* is the result of the transfer of the Flotilla to the Government of Bombay, and the substitution of a charge per head for embarking and disembarking troops.

Item 31A. Compensation paid to Owners of Merchant Vessels on account of Damages caused by Collision.—In 1874-75 the sum of 20,993*l.* was paid under this head: in 1875-76 the amount paid was 4,214*l.*, and was for damage done in October 1873 and October 1874.

6. The only two items which show an increase of expenditure are,—

Item 31. Establishments at the Admiralty in Egypt and in India, &c.—£. 174,—caused principally from payment in 1875-76 of wages of men employed in the bedding store at the Royal Clarence Yard during previous years but not claimed at the time, and

Item 32. Miscellaneous Charges.—£. 4,709, arising chiefly from there having been four embarkations of troops at Queenstown, the absence of large credits for miscellaneous purposes, and from expenses incurred for lights and culinary fuel, implements, and troops mess utensils having hitherto been included under other heads of service.

7. The total net amount for working expenses is further reduced to the extent of 14,435*l.*, consisting of 8,000*l.* paid by the Admiralty for depreciation of the "Serapis" while lent, and of 6,435*l.* for passage of officers and others conveyed on Imperial or "Other Indian" service.

8. As regards the charges (not payments) on account of capital and insurance, I would observe that the sum inserted towards replacement of capital remains as before at 43,612*l.*, and that the sum for interest on unredeemed capital is naturally reduced. On these subjects I beg to refer to the remarks contained in paragraph 6 of my letter of the 6th January 1876, which accompanied the return for the season 1873-74.

9. I beg also to annex a memorandum as to Insurance made up to 1875-76, in continuation of the memorandum which was annexed to my before-mentioned

tioned letter, from which it will be seen that the balance nominally in hand on the troop ships is 244,850 *l.*, and on the tenders and boats in Egypt, 5,033 *l.*

10. Appended to the return is a statement of the cost of the conveyance to England of troops in Her Majesty's Troop Ships "Orontes" and "Himalaya," and in hired vessels at the close of the season, and for whom there was not room in the Indian Troop Ships. With regard to the "Orontes" and "Himalaya," I would beg to observe that the payments were made under special arrangements with the Lords Commissioners of the Admiralty in consequence of the "Serapis" not being available for the Indian Troop Service at the time, and as regards the amount paid to the owner of the "Yorkshire," I have to refer to my before-quoted letter of the 31st July last.

I have, &c.
(signed) *W. R. Mends*,
Director of Transport Services.

The Under Secretary of State,
India Office.

MEMORANDUM as to INSURANCE OF TROOP SHIPS, TENDERS, and BOATS to 1875-76.

TROOP SHIPS.				TENDERS AND BOATS IN EGYPT.			
Dr.			Cr.	Dr.			Cr.
	£.		£.		£.		£.
Payments to Owners, viz.:		Assumed to be set aside for the Year—		Balance in hand 31 March 1876 - - - -	5,033	Assumed to be set aside for the Year—	
Diomed," 30 September 1871	2,000	1867-68 - - -	29,067			1867-68 - - -	351
Atlas," "Secrate," "Juno," and "Mary," 31 March 1874	84	1868-69 - - -	25,371			1868-69 - - -	484
		1869-70 - - -	27,947			1869-70 - - -	528
Paladin," 31 March 1875	20,993	1870-71 - - -	26,030			1870-71 - - -	540
		1871-72 - - -	26,592			1871-72 - - -	510
Valery Jean" and "Wallands," 31 March 1876	4,214	1872-73 - - -	24,278			1872-73 - - -	437
		1873-74 - - -	20,747			1873-74 - - -	410
Balance in hand on 31 March 1876 - - - -	244,850	1874-75 - - -	18,835			1874-75 - - -	382
		1875-76 - - -	15,094			1875-76 - - -	350
			213,961				3,992
		Interest on above at 5 per cent. per annum, to—				Interest on above at 5 per cent. per annum, to—	
		31 March - 1868	-			31 March - 1868	-
		" - - 1869	2,312			" - - 1869	28
		" - - 1870	3,818			" - - 1870	56
		" - - 1871	5,346			" - - 1871	85
		" - - 1872	6,866			" - - 1872	117
		" - - 1873	8,174			" - - 1873	146
		" - - 1874	9,709			" - - 1874	174
		" - - 1875	10,655			" - - 1875	203
		" - - 1876	11,300			" - - 1876	232
	£. 272,141		£. 272,141		£. 5,033		£. 5,033

The sum included in the Return for Parliament of the cost of each year's service has been the amount assumed to be set aside, less the interest accruing for the year. Where an expense has been incurred chargeable against insurance, it has been included under "Wear and Tear," and deducted from the net sum charged for insurance.

RETURN of the Cost, Tonnage, Power, and Consumption of Coal of the TROOP SHIPS "CROCODILE," "EUPHRATES," "JUMNA," "MALABAR," and "SERAPIS," showing also the Expense of conducting the Service in conveying the INDIAN RELIEFS to and from India during the Season 1875-76.

PARTICULARS REQUIRED.	"CROCODILE."	"EUPHRATES."	"JUMNA."	"MALABAR."	"SERAPIS."*	REMARKS.
DESCRIPTION OF TROOP SHIPS.						
1. Tonnage - - - - -	4,173	4,173	4,173	4,173	4,173	
2. Builder - - - - -	Messrs. Money Wigram & Sons.	Messrs. Laird Brothers.	Messrs. Palmer Brothers & Co.	Messrs. R. Napier & Sons.	Thames Iron Ship Building Company.	
3. Description of Engines - - - -	Horizontal direct	Horizontal direct	Horizontal three cylinders, compound.	Horizontal direct, compound.	Horizontal direct	
4. Makers' Name - - - - -	Messrs. Humphreys & Tennant.	Messrs. Laird Brothers.	Messrs. Maudslay, Sons, & Field, compounded at Portsmouth Dockyard.	Messrs. R. Napier & Sons, compounded by them at Glasgow.	Messrs. Humphreys & Tennant.	These ships are fitted with super-heating apparatus and surface condensers, except "Jumna" and "Malabar," which are fitted with surface condensers only.
5. Nominal Horse Power - - - - -	700	700	700	700	700	
6. Mean Speed at Measured Mile - - - - - } Full Power	14.00 knots	14.72 knots	12.57 knots	Not tried on the mile.	13.38 knots	
7. Ditto - - ditto - - Half Power	No trial	11.52 knots	No trial	ditto	No trial	
8. Indicated Horse Power at Measured Mile - - } Full Power	4,040	5,000	2,900	ditto	3,700	
9. Ditto - - ditto - - Half Power	No trial	2,080	No trial	ditto	No trial	
COST OF TROOP SHIPS.						
10. Cost of Ships, ready for Service - -	£. 205,365	£. 210,126	£. 211,253	£. 210,201	£. 206,255	
11. Expense in addition to the foregoing incurred in the case of the "Crocodile" and "Serapis" until 31st March 1867, and for the "Euphrates," "Jumna," and "Malabar," until their arrival in India; being in the first two instances Pay and Allowances, &c. of Officers and others appointed to the Ships before they were complete; and in the remaining cases of Pay and Allowances of Officers and Crews, Messing and Victualling, and General Cost of Navigation of the three Ships from England to India - - - - -	807	15,157	18,058	15,715	897	
Further Particulars respecting the Troop Ships, and Results of the Troop Season, 1875-76.						
12. Mean Speed of each Ship for the Season -	8.40 knots	8.46 knots	8.20 knots	8.11 knots.	—	
13. Total Distance run by each Ship for the Season.	24,808 "	24,456 "	24,171 "	24,020 "	—	
14. Total Coals consumed by each Ship for the Season.	4,692 tons	6,155 tons	4,511 tons	4,260 tons.	—	
15. Average Number of Troops conveyed each voyage, distinguishing Officers, &c. -	Officers - - -	58	61	57	60	—
	Ladies - - -	15	15	15	12	—
	Children - - -	12	14	17	17	—
	Female Servants -	4	2	2	2	—
	2nd Class Passengers:					
	Male - - -	1	1	1	1	—
	Female - - -	1	1	1	1	—
	Children - - -	3	3	2	3	—
	Staff Serjeants -	8	14	14	12	—
	Women - - -	7	9	9	8	—
16. If any breakdown of Hull or Machinery, state cause, number of days' delay, and probable expense of refit or alteration, and if alterations are paid for by Admiralty or Contractor:	Children - - -	19	18	24	19	—
	Troops - - -	790	907	892	965	—
	Women - - -	65	85	92	88	—
	Children - - -	118	140	167	164	—
Breakdown of Hull - - - -	Nil	Nil	Nil	Nil.	—	
Breakdown of Machinery - - - -	Nil	Nil	Nil	Nil.	—	

* The "Serapis" was not employed on Troop Service during the season, but was transferred to the Admiralty from the 8th June 1875 for employment in connection with the Visit of His Royal Highness the Prince of Wales to India. The sum of 8,000*l.* credited to Indian Funds on account of her Depreciation while thus engaged, is abated from the total working expenses at page 9.

PARTICULARS REQUIRED.					OUT.	HOME.	TOTAL.	REMARKS.
Further Particulars respecting the Troop Ships and Results of the Troop Season, 1875-76—continued.								
Total Number of Troops conveyed during the Season.	Officers	-	-	-	544	361	905	Exclusive of interchanges of troops between Bombay and Aden on a home-ward voyage; and of the 173 passengers conveyed on Imperial service, or on the general service of India.
	Ladies	-	-	-	107	122	229	
	Children	-	-	-	72	163	235	
	Female Servants	-	-	-	27	10	37	
	2nd Class Passengers:							
	Male	-	-	-	5	11	16	
	Female	-	-	-	6	11	17	
	Children	-	-	-	9	32	41	
	Staff Serjeants	-	-	-	75	112	187	
	Women	-	-	-	57	71	128	
	Children	-	-	-	115	195	310	
	Troops	-	-	-	7,491	6,654	14,145	
	Women	-	-	-	680	621	1,301	
	Children	-	-	-	854	1,467	2,321	
TOTAL Number of Individuals					10,042	9,830	19,872	On the outward voyages the deaths were, 2 adults and 11 children, and 8 children were born. On the home-ward voyages the deaths were 24 adults and 15 children, and 2 children were born; making a total of 52 deaths and 10 births.
Equivalent to Adults					-	-	18,518	
Average per Voyage					-	-	1,157	

PARTICULARS REQUIRED.	"CROCODILE."	"EUPHRATES."	"JUMNA."	"MALABAR."	"SERAPIS."*	TOTAL.	REMARKS.
Cost of Working the Troop Ships and Victualling, &c. the Troops:—	£.	£.	£.	£.	£.	£.	
1. Value of Stores expended on Hull, Engines, &c.	8,220	26,664	9,089	8,111	7,136	59,220	
2. Cost of Coal consumed	6,660	10,275	6,258	6,163	—	29,356	
3. Cost of Victualling Troops, including Messing.	7,271	7,815	7,700	8,301	—	31,087	The mess contributions of military officers and the ration stoppages of the troops, which form credits to Indian Revenues, are abated in arriving at these figures.
4. Bedding for Troops	213	271	273	288	—	1,065	
5. Cost of Victualling the Crews, including Messing of Officers.	5,141	4,997	4,825	4,936	189	20,088	
6. Pay and Allowances of Officers and Crews.	13,699	13,466	13,573	13,630	843	55,211	
TOTAL Working Expenses	£. 41,224	63,488	41,718	41,429	8,168	196,027	

* See Note on page 6 as to "Serapis."

PARTICULARS REQUIRED.	Amount.	REMARKS.
Capital Charges of the Service, in addition to Cost of Construction of the Troop Ships:	£.	
24. Cost of Construction of Steam Tenders and Boats for use at Alexandria and Suez - -	15,632	
25. Cost of Purchase and Laying down of Moorings at Alexandria and Suez - - - -	4,794	
26. Cost of Construction of Suez Hospital - - - - -	55,303	
27. Miscellaneous Charges connected with the Formation of the Service - - - - -	4,848	
TOTAL - - - £.	80,577	

Miscellaneous Charges of the Service incurred in the Year 1875-76:

28. Transit Charges in Egypt (Passage of the Suez Maritime Canal) - - - - -	28,888	
29. Wages, Coals, Stores, &c., for Steam Tenders and Boats in Egypt - - - - -	2,941	
30. Expenses of Embarking and Disembarking Troops at Bombay - - - - -	1,416	
31. Expenses of Establishments in England, Egypt, and India - - - - -	9,775	
31a. Compensation paid during this Season to the Owners of Merchant Vessels on account of Damages sustained through Collisions in October 1873 and October 1874, and Legal Expenses connected therewith - - - - -	4,214	
32. Fuel and Lights; Travelling Expenses and Gratuitous Clothing for Officers and Crews; Books and Stationery, Pilotage, Telegraphic Communications; Medicines and Hospital Stores, Mess Utensils, &c., and other Contingencies - - - - -	6,545	
TOTAL - - - £.	53,779	

PARTICULARS REQUIRED.	AMOUNTS.		REMARKS.
	On £. 235,371, the Working Expenses (Payments from Indian Revenues) after deducting Repayments.	On £. 318,770, the Working Expenses and Charges (not Payments) on account of Capital and Insurance.	
	£. s. d.	£. s. d.	
Officers - - - - -	56 7 6	78 3 -	
Ladies - - - - -	50 4 3	71 19 9	
Children - - - - -	19 19 9	28 14 -	
Female Servants - - - - -	25 2 1	35 19 10	
33. Estimated Gross Cost of the Service to and from India per Head for each Class, calculated on the Total Number of Troops (Indian Reliefs) conveyed during the Season 1875-76, being the Numbers shown at Item 17 - - - - -			
Second Class Passengers - -	23 3 9	39 1 6	
Ditto - Children - -	18 15 10	26 1 -	
Staff Serjeants - - - - -	12 3	16 9 9	
Wives - - - - -	11 15 5	16 1 5	
Children - - - - -	6 1 10	8 4 10	
Troops - - - - -	9 13 2	12 17 8	
Women - - - - -	9 4 10	12 9 5	
Children - - - - -	4 16 7	6 8 10	

These rates represent the cost to Government, after allowing for the Contributions received under the Royal Passage Warrant.

ABSTRACT OF COST.

PARTICULARS REQUIRED.	"CROCODILE."	"EUPHRATES."	"JUMNA."	"MALABAR."	"SERAPIS,"*	SHIPS OR SERVICE GENERALLY.	TOTAL.	REMARKS.
CAPITAL CHARGES:	£.	£.	£.	£.	£.	£.	£.	
Construction and Equipment of the Troop Ships (<i>see</i> Item 10) -	205,365	210,126	211,253	210,201	206,255	-	1,043,200	
Additional Expenses relating to the Troop Ships (<i>see</i> Item 11) -	807	15,157	18,058	15,715	897	-	50,034	
Construction of Steam Tenders for Egypt, of Moorings for Egypt, and of Suez Hospital, and Miscellaneous Charges (<i>see</i> Items 24 to 27) -	-	-	-	-	-	80,577	80,577	
TOTAL CAPITAL CHARGES - - - £.	206,172	225,283	229,311	225,916	207,152	80,577	1,174,411	
WORKING EXPENSES OF THE SERVICE:								
Expenses of the Troop Ships, and of Victualling, &c. of the Troops (<i>see</i> Items 18 to 23) - - -	41,224	63,488	41,718	41,429	8,168	-	196,027	
Miscellaneous Expenses (<i>see</i> Items 28 to 32) - - -	-	-	-	-	-	53,779	53,779	
TOTAL WORKING EXPENSES (Payments from } Indian Revenues) - - - £.	41,224	63,483	41,718	41,429	8,168	53,779	249,806	
<i>Abate</i> ,—Amount paid by the Imperial Government for Depreciation of "Serapis" during the period of her employment in connection with the Visit of His Royal Highness the Prince of Wales to India -						8,000		Equivalent to 12 <i>l.</i> 14 <i>s.</i> 2 <i>d.</i> per Adult in Troop Ships.
Payments by the Imperial Government for Passage of Naval and Military Officers and others, conveyed in the Troop Ships during the Season, on Imperial Service, and Credits on account of the Passage of Officers, &c., on other Indian Service -						6,435	14,435	
CHARGES ON ACCOUNT OF CAPITAL AND INSURANCE:								
Towards Replacement of Capital, Four per Cent. on Capital Cost, less proportion of Estimated Value of the Troop Ships, for breaking up, at the end of 25 years -	-	-	-	-	-	43,612		
For Interest on unredeemed Capital, at Five per Cent. -	-	-	-	-	-	40,089		
For Insurance on Ships, Steam Tenders, and Boats -	-	-	-	-	-	3,912		
<i>Abate</i> ,—Amount paid in consequence of Collision with Merchant Vessels (Item 31 A.) Chargeable to Insurance -	-	-	-	-	-	87,613		
TOTAL CHARGES (not Payments) on account of CAPITAL and INSURANCE - - -	-	-	-	-	-	4,214		
GRAND TOTAL of WORKING EXPENSES and CHARGES on account of CAPITAL and INSURANCE - - -	-	-	-	-	-	-	83,399	Equivalent to 4 <i>l.</i> 10 <i>s.</i> 1 <i>d.</i> per Adult in Troop Ships.
							318,770	Equivalent to 17 <i>l.</i> 4 <i>s.</i> 3 <i>d.</i> per Adult in Troop Ships.
CONVEYANCE OF TROOPS IN HER MAJESTY'S TROOP SHIPS AND HIRED VESSELS:								
Cost of Conveyance, at the close of the Season, under special arrangement with the Lords Commissioners of the Admiralty, in Her Majesty's Troop Ships, from Bombay to Portsmouth, of 26 officers, 10 ladies, 12 children, 486 troops, 242 women, and 597 children (equivalent to 1,069 adults), for whom there was not accommodation in Her Majesty's Indian Troop Ships -						8,333		
Ditto - - - in Contract Packets, from Bombay to Southampton, of 2 officers, 1 lady, 3 children, 38 troops, 23 women, and 57 children (equivalent to 94 adults), for whom there was not accommodation in Her Majesty's Indian Troop Ships -						2,315		
<i>Add</i> ,—Compensation paid to Owners of a Vessel accepted for Conveyance of Troops from Madras, but subsequently declined -						10,648		
TOTAL Cost in Her Majesty's Troop Ships and Hired Vessels - - -						4,543		
						-	15,191	Equivalent to 13 <i>l.</i> 1 <i>s.</i> 3 <i>d.</i> per Adult.

* See Note on page 6 as to "Serapis."

ABSTRACT of RETURNS relating to the INDIAN TROOP SERVICE for the Nine Seasons, 1867-68 to 1875-76.

	RAILWAY TRANSIT.	SUEZ CANAL.		TOTAL <i>vid</i> RAILWAY AND CANAL.
	Total of Four Seasons, 1867-68 to 1870-71.	Total of Four Seasons, 1871-72 to 1874-75.	Total of Season 1875-76.	Grand Total of Nine Seasons.
Numbers Conveyed :				
Military officers and their families - - - - -	4,935	5,587	1,408	11,930
Military second class passengers - - - - -	253	401	74	728
Staff serjeants and their families - - - - -	2,077	2,286	639	5,002
Rank and file and their families - - - - -	72,690	76,384	17,924	166,998
TOTAL Military - - - - -	79,955	84,658	20,045	* 184,658
TOTAL Individuals, including Naval Passengers - - -	82,324	85,869	20,351	188,544
Casualties :				
Deaths - - - - -	237	322	52	611
Births - - - - -	139	88	10	237
Transit through Egypt :				
Average time occupied by each Division of Troops by Railway	<i>Hrs. m.</i> 14 6	<i>Hrs. m.</i> - -	<i>Hrs. m.</i> - -	<i>Hrs. m.</i> 14 6
Average duration of Passage through Canal - - -	- -	40 16	39 20	40 6
Length of Voyages, including Transit through Egypt :				
Portsmouth to Bombay :	<i>Days.</i>	<i>Days.</i>	<i>Days.</i>	<i>Days.</i>
Shortest voyage, Railway transit - - - - -	30	- -	- -	} 30
Shortest voyage, Canal route - - - - -	- -	30	30	
Longest voyage, Railway transit - - - - -	44	- -	- -	} 44
Longest voyage, Canal route - - - - -	- -	39	33	
Queenstown to Bombay :				
Shortest voyage, Railway transit - - - - -	30*	- -	- -	} 30
Shortest voyage, Canal route - - - - -	- -	30	32	
Longest voyage, Railway transit - - - - -	40	- -	- -	} 40
Longest voyage, Canal route - - - - -	- -	38	33	
Bombay to Portsmouth :				
Shortest voyage, Railway transit - - - - -	29	- -	- -	} 29
Shortest voyage, Canal route - - - - -	- -	30	32	
Longest voyage, Railway transit - - - - -	41	- -	- -	} 41
Longest voyage, Canal route - - - - -	- -	37	34	
Knots run by Indian Troop Ships on the Troop Service - -	423,304	455,586	97,450	976,340

* Exclusive of the numbers conveyed for interchange at an intermediate port.

Admiralty,
15 May 1877.

W. R. Meads,
Director of Transport Services.

C. J. Cruttenden,
Deputy Director of Transport Services, and
Assistant for India.

EAST INDIA (TROOP SHIPS).

RETURN of Cost, Tonnage, Power, and Consumption of COAL, also Expense of Service of the TROOP SHIPS "ORCODILE," "EUPHRATES," "JUMNA," "MALABAR," and "SERAPIS" (in continuation of Parliamentary Paper, No. 119-1, of Session 1876), for the Year 1875-76.

(Presented to Parliament by Her Majesty's Command.)

*Ordered, by The House of Commons, to be Printed:
8 June 1877.*

EAST INDIA (MR. WELD).

767

RETURN to an Address of the Honourable The House of Commons,
dated 17 May 1877;—for,

“ COPY of CORRESPONDENCE and PAPERS relating to the Suspension, in April 1876, of Mr. *Weld*, of the Madras Civil Service, for, as Magistrate of *Negapatam*, Tanjore District, causing the EXHUMATION of a BODY of a SANIYASI buried on the Banks of Drinking Water Reservoir at that Place, and all OPINIONS or DISSENTS of the Members of the Madras Council and Indian Council, if any.”

India Office, }
31 May 1877. }

GEORGE HAMILTON,
Under Secretary of State.

(*Mr. Percy Wyndham.*)

Ordered, by The House of Commons, to be Printed,
14 June 1877.

TABLE OF CONTENTS.

From.	Date.	SUBJECT.	Page
		NEGAPATAM BURIAL CASE :	
Government of Madras to the Secretary of State for India.	28 September 1876 (Financial) No. 28.	Proceedings of Madras Government relative to the removal of Mr. M. R. Weld, of the Madras Civil Service, from his appointment of Acting Head Assistant to the Collector and Magistrate of Tanjore, and to his suspension from all employment for a period of two months, in consequence of certain action taken by him connected with the exhumation of the body of a Saniyasi, which had been buried with Hindu rites on the banks of a reservoir at Negapatam.	3
The Secretary of State to the Government of Madras.	4 November 1876.	Telegram calling for explanations from Mr. Weld and his superior officer, Mr. Thomas, Collector and Magistrate of Tanjore.	12
Government of Madras to the Secretary of State.	15 November 1876 (Financial) No. 36.	The explanations of Mr. Weld and Mr. Thomas, with list and copy of correspondence.	12
Ditto - - - - -	2 February 1877 - (Judicial) No. 5.	Further explanations from Mr. Thomas, with Minutes thereon by Members of the Madras Government.	32
Mr. Weld to the Under Secretary of State for India.	20 February 1877	Mr. Weld requests that, being in England, and the Secretary of State having called for the records of the case, he may memorialise the Secretary of State direct, instead of through the Government of Madras.	44
Under Secretary of State for India to Mr. Weld.	7 March 1877 -	The above request acceded to - - - - -	44
Mr. Weld to the Under Secretary of State for India.	8 March 1877 -	Forwarding Memorial - - - - -	44
Under Secretary of State to Mr. Weld.	3 May 1877 -	Reply to the foregoing - - - - -	49
Mr. H. Thomas to the Secretary of State.	13 April 1877 -	Memorial appealing against the Order of the Madras Government, dated 2nd September 1876.	49
Under Secretary of State to Mr. Thomas.	3 May 1877 -	Reply to the foregoing - - - - -	50
Extract from Minutes -	24 April 1877 -	Meeting of Council of India to consider draft despatch	50
Secretary of State to Government of Madras.	26 April 1877 (Judicial) No. 4.	Reviewing the proceedings connected with this case, and approving the action of the Madras Government.	50
Dissents and Minutes by Members of the Council of India :			
Mr. A. Cassels - - -	24 April 1877 -	Opposed to despatch - - - - -	52
Sir Henry Maine - - -	27 April 1877 -	" " - - - - -	53
General Strachey - - -	7 May 1877 -	" " - - - - -	54
Sir Barrow Ellis - - -	30 April 1877 -	" " - - - - -	54
Mr. R. S. Ellis, C.B. - - -	2 May 1877 -	In support of despatch - - - - -	55
The Marquis of Salisbury -	4 May 1877 -	" " - - - - -	57

COPY of CORRESPONDENCE and PAPERS relating to the Suspension, in April 1876, of Mr. *Weld*, of the Madras Civil Service, for, as Magistrate of *Negapatam*, Tanjore District, causing the EXHUMATION of a BODY of a SANYASI buried on the Banks of a Drinking Water Reservoir at that Place, and all OPINIONS or DISSENTS of the Members of the Madras Council and Indian Council, if any.

Financial Department.—No. 28 of 1876.

From the Government of Madras to the Secretary of State for India.

My Lord Marquis,

WE have the honour to forward, for your Lordship's information, copy of our proceedings, marginally noted, from which it will be observed that we have deemed it necessary to remove Mr. M. R. Weld, Madras Civil Service, from his appointment of acting head assistant to the collector and magistrate of Tanjore, and to suspend him from all employment for a period of two months.

Dated 2nd September 1876, No. 1585.

We have, &c.
(signed) *Buckingham and Chandos.*
W. Robinson.
R. S. Ellis.

Ootacamund, 28th September 1876.

PROCEEDINGS of the Madras Government, Financial Department,
2nd September 1876.—No. 1585.

NEGAPATAM BURIAL CASE.

(No. 20 A.)

READ Petition from *S. Muthookishna Iyer* and others, to His Grace the Governor in Council, Fort St. George; dated Negapatam, 5th June 1876.

May it please your Most Noble Grace,

WE, the undersigned inhabitants of Negapatam, in the district of Tanjore, with due deference, beg to lay before your Most Noble Grace the following facts:—

A Native Brahmin of this town, by name Voobavoo Sastrial, aged 85 years, breathed his last on the 30th April 1876. Two months previously he had entered upon the fourth and the holiest of the orders of life amongst the Sanyasis, technically termed in the Hindu Shastras as "Paramhamsasramum." His body, which became highly consecrated, as it were, under the above circumstances, was enshrined on the northern bank of the tank called Ackaraikolum, within the municipal limits (apart from the town) of Negapatam. The deceased having been a highly educated Sastri in the Achara Prayachitta and Curmaconda portions of the Hindu Vedas and Shastras, and having been equally celebrated for his good and virtuous character, the procession to the burial ground was largely attended by multitudes of all classes of the Hindu community. The body was buried underground, 9 feet deep, in the midst of a large quantity of salt thickly poured on all sides as well as over and below. This mode of burying the dead body is dictated by the Vedantic system of Hindu Philosophy, with apparent view of avoiding percolation. The Shastras prescribe that bodies of the venerable men of the kind should be interred in places to which the public resort for bathing, making ablutions, and for meditating, and

it is no bad idea that arrangements to commemorate the names and recollections of eminent ancestors are made by giving a residence to their sacred bones near tanks, and by the side of pleasant running brooks. On the banks of the aforesaid Ackaraikolum a long usage of burying the dead bodies of Sanyasis has prevailed even after the above-mentioned tank was brought under the operation of the Municipal Act. To prove this a visitor may, even to this day, meet with small columns of bricks or monuments erected over the burials in bygone years. Over the bones of some of these the tree "Arasay" has been made to grow, and is still growing with its wide and leafy branches. Moreover, it is not a fashion obtaining in Negapatam alone, but is the orthodox usage, having force over the countries watered by the Ganges, Cauvery, Vigay, Godaveri, and other sacred rivers and tanks situated anywhere between Cape Comorin and the Himalayas. Under the highly rigid rules of Hinduism, it is only one among thousands that is admitted into the rank of Sanyasi, and it is, indeed, to a very select few of them honourable burial of the above sort is accorded by the community at large. Between the spot of interment and the highest water-limit of the tank, there are about 60 feet of ground protected by long and strong brick steps and a brick platform to guard against percolation. Moreover, there is a wall with a deep foundation between the grave and the tank. The slope of the ground on the side of the grave being also northward, there is not the slightest chance of any contagion spreading. Under the above circumstances we deeply regret to say that the joint magistrate of Negapatam, under Section 528 of the Criminal Procedure Code, by a notice issued to one of the sons of the deceased, dated 6th May, directing him to exhume the body of the deceased from the aforesaid spot to any other locality approved by the municipality within the 13th May, has enjoined that the default will not only be punished under Section 188 of the Indian Penal Code, but the body will be removed to the place known as "Hathaway's Park," where all the nightsoil and dirt of the town are deposited and situated near the Pariah-street. The reason assigned by the joint magistrate was the chance of percolation affecting the waters. The disinterment of dead bodies is considered unhallowed by Europeans, and it is also a sacrilege according to our Shastras. It is highly dangerous if executive officers, municipal or magisterial, were arbitrarily to decide questions of the above nature and disturb by coercion the established current of religious opinion.

It is our humble belief that Section 133 of Act III. of 1871, empowers municipal commissioners, whenever they deem it necessary, to close and open graveyards after issuing notice to the people and upon adopting several steps prescribed by it. A joint magistrate, in exercising his authority under Section 528 of the Criminal Procedure Code, should have regard for the reasons manifested by the Legislature in the Municipal Act. The proceedings in this case have, however, been hasty, and have wounded the feelings of the community. We, in due time, reported our grievance to the district magistrate, but that officer did not help us. The sons of the deceased, for fear of criminal prosecution, removed the dead body to a neighbouring desecrated place.

In conclusion, we, the most dutiful subjects of your Most Noble Grace, most respectfully pray that your Most Noble Grace will be pleased to give to our representations proper consideration and to issue such orders as the justice of the case requires.

(No. 943.)

Referred to the District Magistrate of Tanjore for report.

(signed) *W. Hudleston*, Chief Secretary.

Ootacamund, 20 June 1876.

(No. 20 B.)

READ also letter from *H. S. Thomas*, Esq., District Magistrate of Tanjore, to the Hon. *W. Hudleston*, Chief Secretary to Government, Fort St. George; dated 22nd July 1876.

Abstract.—Submitting the Report called for on the foregoing Petition.

(No. 20 c.)

READ also Petition from *Kistnasamy Iyer*, Head Sheristadar of North Arcot, to His Grace the Governor in Council, Fort St. George; dated Palmanair, 5th July 1876.

Your Grace,

I BEG most respectfully to lay the following few lines before your Grace for favourable consideration and orders, with the humble request that I may be pardoned for thus intruding upon your Grace's valuable moments.

2. My aged father (aged 85 years), having at the close of his days become a *Sanyasi* (monk), died at Negapatam, in the Tanjore District, on the 30th April last. His remains were solemnly buried in the most public manner and in broad daylight at the *customary* Hindu

Hindu burial-ground on the north bank of the Ackaraikolum Tank, in the limits of the town of Negapatam. Five days after, Mr. Weld, the acting joint magistrate at that station, having taken objection to the burial in question, ordered its immediate removal, and the body was accordingly exhumed and re-interred in another locality; Mr. H. S. Thomas, the magistrate of the district, to whom I appealed, having approved of and repeated the orders of the joint magistrate.

3. I have already prepared a memorial on this subject for submission to your Grace's Government, setting forth, in detail, the injustice done me in the matter. I sent it to Madras a week ago to be printed, so that your Grace may read it with ease, and I daily expect to receive it. The memorial will be submitted to your Grace very shortly.

4. Yesterday I heard from Tanjore that a mahazarnamah, addressed to your Grace by the inhabitants of Negapatam, animadverting on the proceedings of the magistracy in this matter, having been referred to the Collector and magistrate, Mr. Thomas, two or three days ago, submitted an unfavourable report to your Grace with regard to the burial in question, and commenting upon my conduct.

5. I beg most respectfully to solicit the favour of your Grace's abstaining from passing final orders on the above report until after perusal and consideration of my memorial above mentioned, which will be submitted to your Grace within a very few days.

6. For this act of kindness I shall, as in duty bound, every pray.

(No. 20 D.)

READ also Petition from *Kistnasamy Iyer*, Head Sheristadar of North Arcot, to His Grace the Governor in Council, Fort St. George; dated Palmanair, 11th July 1876.

My Lord Duke,

I BEG most respectfully to submit the following extraordinary proceedings of the joint magistrate, Mr. M. R. Weld, and of Mr. H. S. Thomas, district magistrate of Tanjore, for your Grace's special consideration and orders. In doing so, I shall not intrude upon your Grace's valuable moments with lengthy arguments and criticisms, but confine myself to a concise statement of the whole facts of the case, with but few remarks thereon.

2. I am a native of Negapatam in the Tanjore District. I have a house there, and the whole of my family live in and about that place. I myself held various appointments under Government in that town and in the Tanjore District up to the end of 1870, when, on the recommendation of Mr. G. Lee-Morris, late Collector of Tanjore, I was sent for to this district by the Collector, Mr. Whiteside, as first-class Tahsildar of the Wallajah Talug, and after three years' service in that appointment, I was promoted to the post of huzur head sheristadar, which office I now hold.

3. In the month of April last, my father died at Negapatam, aged 85 years. He was a Sanskrit pundit, and was universally respected for his wisdom and the purity of his life. He was famous for his extensive knowledge of the Hindu *Vedas* and *Shastras*. He was revered by the whole of the Hindu community of Negapatam, and I may say of the whole district. In his last days he expressed a desire to become a *sanyasi* (monk or saint) according to the principles of the Hindu religion, and agreeably to his wishes, the necessary preliminary ceremonies of atonement were performed, and he, in the month of February last, became a *sanyasi*. He breathed his last at about midday on the 30th April last.

4. According to the Hindu *Shastras*, the remains of *sanyasis* are *buried* instead of being burnt in the usual manner. The burial must invariably take place on the borders of tanks or rivers, or under the shadow of *Aswatha* (*Ficus religiosa*) trees, and generally at places set apart for the performance of religious ceremonies, or for the resort of religious people. Over the graves of *sanyasis*, *pagodahs* or *brindavanums* (equivalent to tombs) are constructed, or *Aswatha* trees, are planted in memory of the deceased; and flower gardens are also laid out at the spot planted with *Tulasi* (*Ocimum sanctum*) plants. For ten days after death, daily ceremonies and afterwards occasional ceremonies or *pujahs* are performed at the grave in honour of the deceased *sanyasi*, as prescribed by the rules of Hinduism.

5. At Negapatam there is a large fresh-water tank, or pond, called *Ackaraikolum*, in which almost the whole of the inhabitants of the town bathe, and the water of which is used for drinking and other purposes. It is situated in the limits of the Puttur village, adjoining Negapatam; but a few years ago the tank was included within the municipal boundaries. The northern, eastern, and western sides, or banks of the above tanks, are from time immemorial used as the burial ground of Hindu *sanyasis* of all castes who die at Negapatam, different portions of the banks being appropriated by different castes of the community. There are distinctive marks, such as masonry buildings and earthen platforms, to show that burials have taken place there. Even after the said tank was included

within the municipal limits, there have been several burials on the tank bund. The accompanying plan* will give an idea of the situation of the different burial grounds, &c., on the banks of this tank.

6. About the place where the *Brahmins* bathe on the northern bank of the tank, the remains of *Brahmins sanyasis* used to be interred from time immemorial; but the last such burial took place about 30 years ago, as during the above period no *Brahmin sanyasi* died at Negapatam, except in one single instance, about 15 years ago, when the body was, for the convenience of the deceased relations, buried on the bund of a pond called *Kakkaholum*, situated in the heart of the town, and much more frequented by the public than the *Acharaikolam* above referred to. The bund of the *Acharaikolam* tank, however, is the ancient and customary public place of burial of the *Hindu sanyasis*.

7. It may here be mentioned that the above locality, where the bodies of *Brahmin sanyasis* are buried, is also used by a large section of the Brahmin community of Negapatam for the performance of religious obsequies of deceased Brahmins, whether *sanyasis* or otherwise. At the above spot there is an *Aswatha* tree, with idols thereunder, which is worshipped by Brahmins on certain occasions. Further, it would appear, the Brahmins have of late, and long before my father's demise, under a license obtained from the municipal commissioners, inclosed this piece of ground with a compound wall, to make the place more adapted for the above purposes. I must, however, here mention that, as I have many relations at Negapatam, the person who so applied to the municipal commissioners on behalf of the Brahmin community, happens to be a relation of mine, and that my brother, like others, contributed towards the cost of constructing the said wall.

8. On the day of my father's death and burial, I was not present at Negapatam. It would appear that immediately after death the body was carried from my house to the above burial ground, in broad daylight, and in grand religious procession, accompanied by upwards of 2,000 inhabitants of the town, consisting of all classes of people, such as Brahmins, Chetties, Sudras, both males and females, old and young. At about 4 p.m. the interment took place in the most solemn manner, the ceremonies being performed at a large expense.

9. On receiving intelligence of my father's demise, I left Chittoor and arrived at Negapatam on the 3rd May last, on the fourth day after the obsequies commenced. On the following morning as I was going to the grave with the whole of my family and friends to perform the ceremonies of the fifth day, we heard to our great surprise that the Joint Magistrate, Mr. Weld, and the Municipal Vice President, Mr. Oliver, were at the burial ground making inquiries about the burial. My brother, Sashappien, who was village magistrate of Negapatam, but not of the locality where the burial ground is situated, at once appeared before the joint magistrate, and, strange to say, that officer by a verbal order immediately suspended my brother from his office, and directed the summary removal of the body of my father from the grave where it had been buried four days before. In the very next breath, Mr. Weld said that he dismissed my brother, and gave a week's time for the removal of the corpse. My brother, in vain, explained to that gentleman that the interment had taken place in the customary place of burial, and begged of him to inspect other tombs, &c., only a few yards from the spot and round the pond, and to make inquiries as to the customary right of the Hindus to use the place as a burial ground. He further pointed out that the order should not be passed so summarily in an important matter of this kind, and urged that he had committed no offence of any kind in his official capacity to deserve dismissal from his appointment in the service of Government. The joint magistrate, however, refused to listen to his prayers. My Lord, no words can express the confusion and dismay into which the whole of my family was thrown at the moment in consequence of the above arbitrary proceedings of the joint magistrate.

10. On making inquiries as to the cause of the magistrate's interference in the matter, I learnt that Mr. Oliver, the Vice President of the Municipality, had induced him to take this action. I at once went to Mr. Oliver in company with two of the Native Municipal Commissioners, Mr. Swayambu Iyer and Sreeramulu Naidu, and we all impressed upon him the religious and solemn nature of the burial in question, and the disgrace and ill-fame the removal of the body would bring upon my family and the Hindu community at large. I also pointed out to him that the interment took place in an ancient and customary public burial ground. Mr. Oliver, admitting to me that he took the initiative in the matter, said that he was not aware of the importance of such burials, nor that the place was a customary burial ground, adding that, if he had been previously informed, he would not have taken any steps, and he would see Mr. Weld that evening, and, as vice-president of the municipality, waive all objections to the burial, which I believe he subsequently did.

11. I then hastened to Mr. Weld and stated the whole of my case to him. He said he would refer the matter to the Collector and magistrate, and I had better go and see him on the subject. I begged of him to inquire into the point, whether the place was a customary burial ground or not. But he would not comply with this request of mine.

12. On the 5th May I proceeded to the headquarters of the Collector and magistrate and

* Sent separately.

and saw Mr. Thomas, who had then on his table the joint magistrate's letter to him on the subject. I related to him all the circumstances of my case, especially calling his attention to the fact of the locality in question being the ancient and customary place of Hindu Sanyasi burials, and to the excessive shame and annoyance that I and the whole of my family would be subjected to by an order to disturb the body once solemnly and peacefully buried with all the ceremonies prescribed by my religion. The alleged necessity for the removal of the body being said to be the ultimate supposed injury to the water of the tank by the percolation of the decomposed matter of the body, and the consequent danger to the health and life of those who may drink the water, I expressed my willingness to adopt, at my own cost, any remedial measures which might be prescribed to prevent any possible future injury to the water of the tank. Mr. Thomas considered my proposition for awhile, and then suggested to me that a good quantity of lime thrown round the body in the grave might answer the purpose. I then informed him that not less than 240 seers of salt had been packed round the body in the grave, and that I was prepared to carry out his suggestions at any cost. He, however, said that the doctors must be consulted on the point. I requested him to make the suggestion to the doctor at Negapatam, or to any other doctor. He told me I had better myself go and inform the Vice President, Mr. Oliver, and the Joint Magistrate, Mr. Weld, of his suggestion. I begged of him to be pleased to write and tell those officers of the arrangement that he thought might be made in the matter. He then told me to take leave and go back to Negapatam, and began to write the letter. I left him. A few minutes after, however, he sent for me again, and told me that he would not allow me the indulgence of adopting the remedial measure above referred to, but commanded that *within that evening* I should remove the body from the grave. It was then past 3 p.m., and I was at Vallum, at a distance of about seven miles from the Tanjore Railway Station, where the train was due just about that time. I represented to the magistrate that it was impossible for me to carry out his orders, as I could not by any possibility catch the train or otherwise be at Negapatam before the evening. He then ordered me in very severe and stringent terms to remove the body within the following day, and warned me that, if I disobeyed his orders, he would see that I suffered the heaviest penalties of the criminal law. I lastly solicited him, at least, to inquire whether the place in question was not an ancient burial-ground, as alleged by me, and then dispose of the case on its merits, and not to proceed so summarily in a matter of such grave importance to me. He then observed that I was impertinent, and threatened that he would report me to my Collector. I finally left him in great sorrow.

13. I returned to Negapatam, and engaged two lawyers to appear before the joint magistrate and apply for a formal inquiry into the matter, and to file a statement of my objections (copy of which forms Appendix A to this Memorial). The joint magistrate received the petition, but made no inquiry. On the contrary, he caused to be served upon my brother, who was at that time present in his cutcherry, a magisterial notice (translation of which forms Appendix B, and true copy of it Appendix C.) to remove the body within a week. With this order in his hand, my brother returned home. My Lord, I here beg to request your Grace will be pleased to consider for a moment the extreme state of mortification and sorrow into which I and all my relatives and friends were thrown at this time.

14. On the night of the same day (6th May) which was the seventh day of the obsequies, a deputation of the townspeople came to me to say that they were prepared to proceed to the Neilgherry Hills, and there see your Grace on the subject. After a careful deliberation of the matter, and considering my position under Government, I came, however, to the conclusion that I had better not take any such proceedings against the orders of the local European magistracy, whatever might be the amount of injury that I might thereby sustain; and with great difficulty I induced them to desist from their proposition.

15. Having no other alternative, I then resolved to remove the body at once in obedience to the magisterial notice, notwithstanding the disgrace and expense attendant thereon. I purchased out of my own pocket a piece of ground in the neighbourhood of the tank, which was pronounced to be unobjectionable by Mr. Oliver, the vice-president. On the night of the 7th May last I had the body removed, with no small amount of trouble, to the new place, where, at a considerable cost, all the ceremonies, once already performed at the original grave, from the day of death up to that day, had to be repeated, in addition to certain other ceremonies of atonement on account of the removal of the body. My Lord, whenever I think of what transpired at Negapatam in connection with my father's burial, I cannot but call to mind with indignation the arbitrary proceedings of Messrs. Weld and Thomas.

16. This, unfortunately, is not all. My brother has since been formally dismissed from his office of village munsif and puttamonigar of Negapatam, on the alleged ground that, as village magistrate, he ought not to have interred the body at the spot. My Lord, first of all, my brother was not the village officer of the locality where the burial took place, and, as such, he had no local jurisdiction of any kind there; and he simply did what every ordinary man would do under the circumstances, he interred the remains of his father at the usual and customary burial-ground. This is the sin my brother is said to have committed, and which, in the eyes of Mr. Weld and Mr. Thomas, is so heinous as to deserve summary removal from the service of Government. I pray that your Grace will be pleased to consider for a moment if there is any shadow of official connection on his

part with the burial in question. Again, the tahsildar of Negapatam, Venkatrayulu Naidu, who has served Government honourably and with credit for many years, and who has been decorated, moreover, with a valuable jewel, as a special mark of the favour of Government on one occasion, has actually been compelled by Mr. Thomas to send in his resignation and apply for pension, because he is alleged to have assisted in the so-called objectionable burial; whereas he went to the spot merely in his private capacity to honour the occasion, and show respect to the memory of my late father, of whom he was a friend.

17. I beg to summarise below the several important points for your Grace's benign and favourable consideration:

I. The locality where the burial in question took place is an ancient and customary burial-ground. There are many old residents of Negapatam who can prove this fact; there are also masonry and other marks on the ground to prove it. The joint magistrate, Mr. Weld, would not inquire into this matter, although I earnestly begged him to do so. Why he would not is a mystery to me. This point deserves your Grace's serious notice.

II. As an old burial-ground, if it was objectionable to allow further burials to take place there, the proper course, I need hardly point out, should have been for the municipal commissioners to close it, under Section 134 of the Towns Improvement Act III. of 1871, and to provide a new burial-ground, as required by Section 135 of the same Act. They have done neither. As similar burials have taken place within the last few years, or subsequent to the inclusion of the tank in question within the municipal limits, it may be fairly assumed that these burials had the tacit consent and sanction of the commissioners. At present there exists no burial-ground in the large town of Negapatam where the bodies of deceased Brahmin and other Sanyasis can be publicly and unobjectionably buried. I request your Grace to consider whether it was in any way just or legal, under the above circumstances, to order the removal of the body once interred in the customary burial-ground. Moreover, the course adopted by the joint and district magistrates of Tanjore in the above case is in direct opposition to the spirit of the standing orders of Government with regard to ancient burial-grounds (*vide* Board's Standing Order, No. 31, Dalryell's Edition).

III. Mr. Oliver, the vice-president of the municipality, who was indirectly the cause of all this trouble to me, apparently abstained from taking proceedings in the case under the Municipal Act, knowing full well that he must eventually fail, and that the Hindu community would establish their ancient right to bury at the spot. While so, the joint magistrate, Mr. Weld, hastily concluding that the burial in question was objectionable on sanitary grounds, took upon himself the responsibility of summarily ordering the removal of the body in an illegal manner, in the absence of any complaint from the townspeople or of the municipal commissioners, and this in spite of our earnest and reasonable protests.

IV. Even supposing that the burial in question was objectionable on sanitary grounds, could no remedial measure have been devised, which, as I assured Mr. Thomas, I would gladly carry out, no matter at what cost, instead of having recourse to the extreme measure of hastily and summarily ordering the removal of the body once properly buried? Throughout the whole country (Tanjore not excepted) Hindu and Mahomedan burials daily take place on the banks of tanks and ponds. What arrangements have been made to stop all these burials, or to exhume and remove the bodies recently interred? Why, I would ask, should my case be treated with such exceptional severity and hardship? The body of my father was not, your Grace will perceive, carelessly buried; the large quantity of 240 seers of salt was laid under and placed all round and over it in a deep grave, so as to preserve the body from decomposition. Between the place of burial in question and the water in the tank there are solid flights of masonry steps, platforms, and walls with foundations, as will be observed from the accompanying plan. There was, therefore, really no fear of danger being occasioned to human health or life by contamination of the water of the tank, so as to justify the extreme measures adopted by the magistracy in this case. Ordinary people cannot comprehend the theory of decomposed matter from the body ever penetrating this masonry and coming in contact with the water of the tank. To none of the 2,000 inhabitants of the town who were present on the occasion did it occur that the burial in question was objectionable on sanitary grounds. It did not so occur to the experienced tahsildar and magistrate, Venkatrayulu Naidu, who has been found fault with and punished so severely for being present on the occasion, as stated above. How could it then occur to my brother, who is a man only of ordinary ability, and just then in deep grief at the loss of his beloved father, that the burial was so extremely objectionable, especially as the locality was always used for burials of the kind? That there was no secrecy about the burial in question will be clear from what has been stated above as to the place, time, and manner in which it took place, and yet not a single soul in the whole town took objection to the burial, either at that time or subsequently. People continued to bathe in the tank, and to drink its water, as usual, from the moment after the burial took place.

18. Thus

18. Thus your Grace will observe that the disinterment of the body in question was quite unnecessary, and that the magistrate has acted in a most indiscreet manner, with entire disregard to the feelings of the Hindu community at large, and which is also altogether opposed to the ordinary principles of justice. The arbitrary procedure adopted by Mr. Weld is not less remarkable than the order for removal. First, there was a verbal order of suspension of my brother from his office; in the next breath, a verbal dismissal; the next moment, a verbal order to remove the body at once. When I sent two lawyers to put in a statement of my objections, no inquiry whatever is held, and no redress is given me; but a written notice is served upon my brother, under what law or section of the Code of Criminal Procedure I am not informed. Whether this omission was not intentional, so as to give me no opportunity to question the order which the magistrate saw I was protesting against, I leave it to your Grace to decide. The notice, if justifiable at all, ought to have been under Section 521 of the C. P. C. I was, under the provisions of the code, entitled to the verdict of a jury or punchayet, to be constituted by the joint nomination of myself and the magistrate as to the injurious nature of the act complained of, and whether the body ought or ought not to be removed from the spot. I beg to ask, why should I be denied this right, which the law gives to every one of Her Majesty's subjects in this country? Was it because I am the head sheristadar of an important district, and my brother a village munsif, or because the Negapatam taluq magistrate happened to attend, as a friend, the funeral of my father? Not satisfied with the order for removal, not content with his arbitrary procedure, the joint magistrate, Mr. Weld, was pleased and thought it proper to treat the sacred remains of my father, a venerable Hindu Sanyasi, with contempt and insult, as evidenced by his notice (Appendixes B and C), which enjoins that if, in accordance therewith, the body be not removed, not only would my brother be prosecuted under Section 188 of the Indian Penal Code, but also he (Mr. Weld) would cause the body to be removed on behalf of Government, and have it reinterred in what he calls "Hathaway's Park." The so-called park is notoriously the place set apart by the municipal commissioners in the south-west of Negapatam for the deposit of the nightsoil and rubbish of the town, and where, I believe, dogs are buried! At all events, it is not a new burial-ground provided by the municipal commissioners under Section 135 of the Towns Improvement Act, or an existing burial-ground where decent human burials could take place. Surely Mr. Weld could hardly expect me to understand that that place of filth was henceforward to form the future burial-ground for Hindu Sanyasis. That cannot be. The use of the words "Hathaway's Park," therefore, in the notice in question, was clearly to insult and annoy me and my family. I would earnestly ask your Grace what necessity was there for the magistrate to use this most improper and wholly uncalled-for expression in his notice? Mr. Weld should, I submit, be required to answer this question to your Grace's satisfaction.

19. In conclusion, if the magistracy were acting under the *bonâ fide* belief that the removal of the body was absolutely necessary for the protection of public health, be it so. But it is the manner in which we were treated, the hasty and inconsiderate mode in which the order was given, the illegal and irregular procedure throughout adopted by the magistracy, the utter disregard of the sacred nature of the burial, the insulting and contemptuous treatment of the remains of the deceased Sanyasi, the high-handed manner in which the rights of a large section of the Hindu community have been trifled with—it is such conduct on the part of the joint and district magistrates that it is my chief object to bring to your Grace's serious consideration. In my particular case the mischief has been done, and the odium incurred. Nothing, therefore, now remains for me to do but respectfully to lay these extraordinary and unprecedented circumstances before your Grace, for such consideration and orders as your Grace may deem just and proper, after calling for the records of the case, and the correspondence that passed between the joint and district magistrates on the subject, in which, I believe, my timely remonstrances and prayers must have found place.

20. Finally, Mr. Thomas has, for some unknown reason, not as yet written to my Collector, as he threatened he would, against my supposed misconduct in the matter in question. I wish he had done so; for in that case Mr. Whiteside, my official superior, would have been in a position to express freely his official opinion on the case.

APPENDIX (A.)

STATEMENT of Objections filed before the Joint Magistrate of Tanjore.

THE place where our father's remains have at present been interred is a locality which from time immemorial has been appropriated for the interment of *Brahmin Sanyasis* and others. There is no other place in the municipality set apart for the same, nor has the municipality or magistracy ever expressed their disapprobation thereof by closing the ground or otherwise. No more than about three years ago there have been interments there of a similar nature, which have been tacitly allowed.

2. The way in which the body has been interred is such as not to cause any harm to the sanitation of the public, because as much as 10 cullums of salt have been carefully thrown round the body, so as to eat up any impurities that it may cause.

3. The interment of the body is one of a strictly religious nature. The deceased was a Sanyasi, and a venerable old Brahmin, of nearly 85 years; and such a halo of sanctity envelopes his tomb in the eyes of the public, that should we be compelled to disturb it, it will be a grave sacrilege in the public opinion, not to speak of the extreme pain to our feelings it will cause. This opinion of the public may lead to grave social harm to ourselves, which may even go the length of our excommunication from our caste.

We therefore beg that the honourable Court, whatever it may think it judicious to order about matters of this sort in future, will be pleased to let this interment undisturbed in consideration of the foregoing circumstances.

(True Copy.)

(signed) *Kistnasamy Iyer.*

APPENDIX (B.)

TRANSLATION of the Joint Magistrate's Notice.

MR. M. R. WELD, Acting Joint Magistrate of Tanjore in charge, hereby orders Sashappien, Village Munsif of Negapatam, that is to say :—

Whereas you have buried the corpse of your deceased father on the bund of the Acka-raikolum Tank, attached to Negapatam, which contains fresh water, which is chiefly drunk by all the people; and whereas the water that will ooze out of the body so buried will go and fall into the water of the said tank, situated close by, and thereby it is likely to cause nuisance and disease to the people who drink the above water; you should, within the night of Saturday the 13th instant, take out and remove the said your father's corpse. If you do not within that time take it away, not only will prosecution be taken against you, under Section 188 of the Indian Penal Code, the body will be removed on behalf of Government, and buried in the place called Hathaway's Park, or it will be dealt with in any other manner which may be convenient.

(signed) *M. R. Weld,*

Negapatam, 6th May 1876.

Acting Joint Magistrate.

(True Translation.)

(signed) *Kistnasamy Iyer.*

(No. 20 E.)

READ also letter from *H. S. Thomas*, Esq., District Magistrate of Tanjore, to the Hon. *W. Hudleston*, Chief Secretary to Government, Fort St. George, dated 25th July 1876, No. 2815.

ABSTRACT.—Submitting copy of an explanation from the head assistant magistrate regarding his order for the removal of the body of the deceased Brahmin from its place of interment.

(No. 20 F.)

READ also letter from *H. S. Thomas*, Esq., District Magistrate of Tanjore, to the Hon. *W. Hudleston*, Chief Secretary to Government, Fort St. George, dated 15th August 1876.

ABSTRACT.—Submitting report and all connected papers in the case of the burial and exhumation of the body of the Sanyasi at Negapatam.

(No. 20 G.)

ORDER THEREON, 2nd September 1876, No. 1585.

THE Governor in Council has perused these papers with the utmost regret. It is clear that the place of interment was and had been a customary burial-place for Brahmin and Sudra Sanyasis, and that no steps had been taken by any authority to prohibit such burials, or to prohibit the use of the place as a place of burial, under the powers of the municipal

municipal or any other law. There can be no doubt also that any danger of contamination by impurity from decomposition of one body buried at a distance of 15 or 20 yards from the water, with a thick wall and a large flight of steps intervening, might have been entirely prevented without the removal of the corpse from the grave.

2. Under such circumstances the joint magistrate, hastily and without investigation of the circumstances, proposed to put in force the utmost powers of the law; and without taking warning from the doubt suggested by the letter of the Acting Collector, issued an order purporting to be under the statute, but in which he incorporated a threat entirely unjustified by the statute, and which was an insult to the feelings of the family, and of the entire Brahmin and Hindu community, as well as an outrage to decency.

3. Mr. Weld has shown himself to be, at present at least, entirely wanting in the qualifications essential to the due exercise of judicial or magisterial functions. He will accordingly be removed from his appointment as acting head assistant in Tanjore; and suspended from all employment for two months; and it is further ordered that the exercise of all magisterial functions be withheld from him, until powers are again expressly conferred by order of Government.

4. The Governor in Council has also to consider the action of the Acting Collector in this matter, and while the Government is able with satisfaction to recognise Mr. Thomas's strenuous efforts for improved administration in Tanjore, and to allow due weight to the fact that cholera had for long raged in Negapatam, and spread thence with most fatal effect over the length and breadth of the Presidency, and that he was ignorant of the crowning offence offered to the people concerned by his subordinate, they cannot disguise from themselves the fact that he omitted to institute close examination in a most delicate case, where he admittedly entertained doubt, and that his action failed to secure reasonable consideration for those who claimed and were entitled to claim from him protection from the acts of his subordinate, and a due regard for the religious customs of the community. They regret also to have to condemn the tone of his comments on the facts of the case. But they are willing to credit him with an exaggerated idea of the imperative necessity for supporting the action of his subordinate in a town which had been stricken with disease of a malignant type, and in a line of action which he thought could be held to be within the letter of the law. This feeling appears, unfortunately, to have led him to forget that the very large discretion granted by the statute imposes a corresponding increased responsibility upon those who enforce it, and thus an unnecessary, harsh, and unfeeling procedure was allowed against those whom it was his especial duty to protect from anything like oppression or wrong. His continued severity, however, in sanctioning the steps taken with regard to the municipal officers, when he was aware that the case was under appeal to Government, appears not only to have been harsh in itself, but unjustifiable and ill-judged in the extreme, and the Governor in Council regrets to be obliged to record his marked condemnation of it.

5. The Governor in Council directs that Seshappier, the son of the deceased, be at once restored to the post of village magistrate, from which he was dismissed, and that the family be informed of the extreme regret with which Government have learnt the distress to which they have been subjected, and of the desire of Government to relieve them from all expense connected with the provision of the second burial-place and the ceremonies on the reinterment. The Collector will endeavour to ascertain the amount from them, and will at once reimburse it, reporting his proceedings for confirmation.

6. The municipal commissioners will no doubt act in regard to their dismissed servants in accordance with the spirit of this decision.

7. The case of the tahsildar appears to depend on some distinct considerations. The Government, however, desire that this present matter may in no respect prejudice its disposal.

8. In conclusion, his Grace the Governor in Council desires to record his marked approval of the course adopted by the family of the deceased and their fellow-townpeople in the circumstances which arose after the funeral. The temper and moderation of their representations under extreme provocation, and their entire abstinence from any violent acts or language, under circumstances which were calculated to excite the warmest feelings of grief and anger, are entitled to the highest commendation.

(True Extract.)

W. Hudleston, Chief Secretary.

To the District Magistrate of Tanjore.

„, the Board of Revenue, through the Revenue Department.

Extract from paragraph 3 to the Accountant General.

TELEGRAM from the Secretary of State for India to the Governor of Madras,
4 November 1876.

YOUR Financial Despatch, 28, forwards petitions against Mr. Weld, but no explanations from him or Mr. Thomas. Please send them at once.

Financial Department.—No. 36 of 1876.

From the Government of Madras to the Secretary of State for India.

My Lord Marquis,

REFERRING to your telegram of the 4th instant, we have the honour to forward herewith, the explanations of Mr. Thomas and Mr. Weld in the late Negapatam burial case.

* 2. We forward also an abstract of the vernacular record in the case, with copy of the English portion.

We have, &c.
(signed) *Buckingham and Chandos.*
Neville Chamberlain.
W. Robinson.
R. S. Ellis.

Fort St. George, 15 November 1876.

P.S.—Since this Despatch was drafted we have received from the magistrate of Tanjore a further letter of explanation in the case which we shall in due course forward to your Lordship, with our proceedings thereon.

PROCEEDINGS of the Madras Government, Financial Department,
2nd September 1876.—No. 1585.

NEGAPATAM BURIAL CASE, No. 20-B.

READ the following letter from *H. S. Thomas*, Esq., District Magistrate of Tanjore, to the Chief Secretary to Government, dated Agastiyampalli, 22nd July 1876:—

I HAVE the honour to submit the report required by the endorsement, No. 943, dated 20th June 1876.

* Not yet received back from the Head Assistant Collector. A reminder has been sent him.

2. The enclosed petition* is somewhat numerously signed certainly, but there are more than enough of idle or ignorant people who will sign almost anything but a bond, and I am quite sure that 50 times as many signatures could readily be procured to the very opposite of this petition, and that it does not really represent the feeling of the town of Negapatam.

3. Nevertheless I will review the points of the petition on their merits.

4. The burial of Saniyasis in the neighbourhood of frequented watering places was once as much a practice of the Hindu church as the burning of widows, the offerings to Jagganat, hook-swinging, fire-walking, and such like. But at the present date such burials are not, in my opinion, more defensible than the other practices aforesaid, nor more desired by the people even, though Government has declared against the other practices, but not been called upon, that I am aware of, to express an opinion on such burials. This petition claims, however, that they are in accordance with "the established current of religious opinion," which it is said to be "highly dangerous" for executive officers to disturb. It seems necessary, therefore, that Government should now pronounce on such burials.

5. If the joint magistrate had permitted the burial to remain unchallenged, and I too had countenanced his permission in the face of a petition which I had to the contrary,
and

and the natural result had followed, that by percolation the main drinking supply of the sown of Negapatam had been poisoned, and a goodly proportion of the hundreds, nay, thousands, that resort there daily, had died or suffered, I do not see how we could have justified ourselves in the eyes even of the people committed to our care, still less before the Government we represent and serve.

6. So much for the general claim to poison drinking-water by such burials. I turn now to the special claim that there is a right to bury Saniyasis in the particular place in point.

The joint magistrate's report on this point is clear, and runs as follows:—

“Even if the place where the Saniyasi has been buried were clearly shown to be a burial-ground, and even to be private property, it would be no reason for not issuing an order to remove the nuisance. Nuisances created by factories, &c., are, as a rule, on private property, but a man may not use even his private property to the detriment of the public health.

“There is, however, nothing to support the contention that the place is a burial-ground, except the vague assertion that someone was buried near the place some 30 years ago, and that a Śudra Saniyasi was buried on another part of the tank bank three or four years ago; but if the authorities were careless then it is no reason they should be so again; the fact that burials have been made round the tank at long intervals of time does not constitute the tank banks a burial-ground. It is entered in the Peimash as a Brahman's bathing-place.”

7. That the son who performed the burial well knew that there was no right to bury Saniyasis there is clearly shown by his action in the matter. He procured from the municipality the liberty to inclose the spot, not for the purpose of burying, but for making a bathing-place. The real object having thus been concealed, the grave too was stealthily dug under cover of the surrounding walls, and the gate furthermore was locked. I think it is clearly inferable that he well knew that if his intention had been foreseen by the municipality it would in the interests of sanitation have been prevented, and therefore he thought to gain his end by stealth.

8. In stealth also he would have failed had he not been himself the village magistrate, and had not the tahsildar been a man who was taking his pension in a month and without any further care for the good opinion of his superiors. The tahsildar accompanied the procession, and the police consequently suspected no necessity for their intervention. They saw indeed a burial procession which of course was public, but as the taluq magistrate was present they could not think the interment was about to be made in an objectionable locality, and it was this last intention that had been kept secret.

9. The use of salt in such burials is, I understand, to prevent mundane effluvia detracting during interment from the sense of sanctity attached to the body of the holy deceased. But its action can in a moist soil be only temporary, and both from subsequent personal observation, and from the report of the joint magistrate, it was obviously inevitable that the decomposed body must very shortly percolate into the tank, for it was in a purely sandy soil with no other drainage. This view is further supported by a medical opinion taken at the time and now enclosed.

10. The real hardship in the case was the exhuming. It caused me *much* pain to witness the distress of a younger son when appealed to, to prevent it. But it would have caused me more to have seen the death of hundreds accruing from my own weakness in yielding to my feelings, rather than being governed by my reason and sense of duty. I doubt not the joint magistrate went through a like conflict of personal feeling.

11. That he was as sympathetic as he could be in the discharge of his duty is indicated by the length of time he allowed for the reburial, time which would be ample for all religious ceremonial, and even for a personal visit to Madras to obtain from Government a cancelment of the order. The length to which he carried his consideration was only justified by the presence of salt, and the fact of the deceased being emaciated. Had low-caste hands performed the exhuming, at once there might have been room for complaint of disregard of caste scruples. As it was, it was left for the friends and fellow-castemen of the deceased to make their own arrangement, and the alternative of disobedience was of course the removal of the body by others, and none but pariahs would be at the disposal of the magistrate, so that there was no real threat conveyed in the explaining of this alternative; it was only a clear warning to the parties that the difficulty could not be met by a mere money fine, that the source of probable disease and death *must* be removed somehow, and therefore that it had best be done by the relatives.

12. If any seeming hardship still remained, it must be remembered that the buriers of the deceased brought it on themselves by the stealthy way in which they deliberately set at naught the authorities, and the health and lives of the community, to say nothing of their feeling of distaste to bathing in and drinking of water contaminated by the drainage from a decomposed human body. In short, he deliberately placed the authorities in a forced position, from which there was no escape, except by exhuming. He had therefore to reap what he sowed.

13. About the legality of the order under the peculiar circumstances of the case, I entertain no doubts, and I examined this question to the best of my ability. A copy of the order is enclosed. It was at the verbal instance of the vice president of the municipality that the joint magistrate moved.

14. The parade in the petition about removal to a desecrated place is hollow. It was simply a question of expense for extra religious ceremonial to sanctify the new spot, and that spot was a private spot of their own selection.

15. One of the sons who carried out this stealthy burial, in defiance of sanitation, of authority, and of public feeling, is a man who ought to have known better. He is Krishnasami Iyer, the head sheristadar of the Collector of North Arcot, and presumably not ignorant of the sanitation questions of the day. In the heat of his distress I pitied him, and did not report him to his Collector, but now that the matter is deliberately revived, and the right to such burials is seriously contended for, I venture to submit for consideration whether he might not in some way be given to understand that the Government view his conduct with displeasure. Police, municipal and other subordinates in this district who failed in their duty, have been severally dealt with.

Under Section 519, Criminal Procedure Code.

To *Seshappayan*, Village, Munsif of Negapatam.

WHEREAS you have buried the body of your deceased father on the Akkaraikolom Tank Bank, which contains good water, useful to the public at large for drinking purposes, and whereas the impurities of the body by percolating through and polluting the water, will cause injury and sickness to those using the water, I do hereby direct and require you to remove the said body of your father before the night of Saturday the 13th instant. If you do not remove it within that time, you will not only be prosecuted under Section 188, Indian Penal Code, but also the body will be removed by the Government, and buried in the place called "Hathaway's Park," or will be disposed of in whatsoever manner it will be most convenient to do.

Negapatam, 6 May 1876.

(signed) *M. R. Weld*,
Acting Joint Magistrate.

(True Translation.)

(signed) *H. S. Thomas*,
District Magistrate.

From Surgeon *L. Beech*, Acting Zillah Surgeon, Negapatam, to the Sub-Collector of Tanjore, dated 7th May 1876, No. 90.

WITH reference to our conversation of the 5th instant, I have the honour to inform you that I visited the Akkaraikolum in company with Mr. Oliver, the vice president of the municipal commission, and it is my opinion that, notwithstanding there being a flight of steps which are between the tank and the grave of the deceased, organic and other decomposing matters must obtain entrance into the tank in question from the body of the Brahman, who was buried within 15 or 20 yards of the edge of the tank, and from the nature of the soil, which is sandy, the percolation would be carried on under the most favourable conditions imaginable.

(No. 20-c.)

READ also the following Letter from *H. S. Thomas*, Esq., District Magistrate of Tanjore, to the Chief Secretary to Government, dated Point Calimere, 25th July 1876, No. 2815.

IN continuation of my letter, No. 2764, dated 22nd July 1876, I have the honour to forward the enclosed, this day received from the head assistant magistrate, and to return the Government petition.

From *M. R. Weld, Esq.*, Acting Head Assistant Collector of Tanjore, to the Collector of Tanjore, dated 21st July 1876, No. 185.

WITH reference to your letter of the 14th July 1876, No. 2693, I have the honour to inform you, that I stated in the order, that if the body of the Saniyasi was not removed by the relatives, it would probably be buried in Hathaway's Park, because the vice president of the municipality on being asked by me where the body could be buried, replied that there was no other waste ground at his disposal, and that if we were obliged to remove the body, that was the only place in which we could put it.

2. I was, as you have observed yourself, very sorry for the sons, and suffered a great conflict of feeling when resisting their entreaties, and when Pleaders Saminda Iyer (late Government Pleader), and Amasami Iyer, old acquaintances of mine, came to speak about it, I consulted them as to the cemeteries, and times at which they should be observed, and settled the time specified in the order in accordance with what they told me. I am sure that they will bear me out when I say that I did all I could to render the matter as little hurtful to the feelings of the family as was consistent with insisting on the removal of the body.

(No. 20-D.)

READ also the following Letter from *H. S. Thomas, Esq.*, District Magistrate of Tanjore, to the Chief Secretary to Government, dated 15th August 1876, No. 3051.

I HAVE the honour, as directed, to submit all the papers* in the case of the burial and reburial of the Saniyasi at Negapatam.

* To be returned as per enclosed list.

2. To make them readily intelligible, I should explain that, immediately on the receipt of the Government endorsement, I sent it into the office for the preparation of a report, but not liking the office draft I drew up a report myself. This was on 28th June 1876, so that allowing for the postage to my camp it will be seen there was no manner of delay on my part.

3. I had then no knowledge that Hathaway's Park had been specified in the acting joint magistrate's notice, but hearing that it had been, I stayed my draft and wrote to the joint magistrate for a copy of his notice, and, finding that it was so, I wrote again wishing to know the reason for Hathaway's Park having been selected, and this was before Government asked that same question. Before I could get the reply I received stringent telegrams from Government, which impelled me to send them at once my draft, incomplete as it was, and to tell them what it was that I was waiting for to complete it. This then must be the explanation of the necessary incompleteness of my report as far as it touched on the Hathaway Park question. If I had not received such stringent and repeated telegrams, I should have had time to wait the last reply and recast my draft in the parts which refer to the Hathaway Park question. All the rest wanted no recasting.

4. On that question Mr. Weld's explanation† is now inclosed in his own words.

5. On the questions which concern the municipality the answer‡ of the vice president is also inclosed in his own words, for it is a correct answer and full in all respects but one, which is, that Brahmans do not bury, they burn their dead. Saniyasis, be they Brahmans or Sudras, are buried. Lingayats and a few other Hindus also bury, and it seems that Hindu children are buried; but the point has not arisen at all in the present case. If any number of burial grounds had been provided the Saniyasi burial now in question would still have been surreptitiously conducted in order that he might have been placed in that very spot as one of public resort, and one therefore in which the fame of the dead would have been prominent, albeit to the injury of the living.

† In the original to be returned. No. 34 in the List.

‡ In the original to be returned. No. 36 in the List.

6. It will please be borne in mind, however, that municipal questions have no proper pertinence to the action of the joint magistrate and myself in this matter. We had before us a body actually buried in close proximity to the main source of a drinking water of a large town. The question was not what ought or ought not to have been done by the municipality to prevent it, but what was now to be done by the magistracy to remove the evil of the existing fact; to remove the imminent danger to the health and lives of the community.

7. With reference to the remark, "Rule in Negapatam seems to be much disorganised," it may suffice to say that I imply no blame either to Mr. Weld or the vice president.

8. With reference to the tahsildar, I may mention that that too is a history of itself which is now separately before the Revenue Board.

9. With reference to the sub-magistrate I have made a thorough personal inquiry, and have thought best not to transfer him elsewhere even on equal pay.

10. The police also are not, in my view, to blame.

11. In the submission of this report there has been one day's delay. It has resulted from the innumerable interruptions on a return to headquarters. I am very sorry for it; but I could not possibly help it.

From *H. S. Thomas*, Esq., District Magistrate of Tanjore, to the Joint Magistrate of Tanjore, dated Vallam, 16th August 1876, No. 3065.

AMONG the several papers transmitted by you in connection with the burial of Ubbasastri, I found copies of some not attested by you. As I cannot attest them for you, and as there will necessarily be a further delay in returning them for your signature, I have submitted them to Government as received. Please see that no such omissions occur in future.

LIST of PAPERS submitted to Government with District Magistrate's Letter, dated 15th August 1876, No. 3051.

	From and to Whom.	Date and Number.	Subject.	Remarks.
1	From Joint Magistrate to District Magistrate.	160; 4 May 1876 -	Asking instructions as to whether an injunction may be issued to remove the body of a Brahman, under Section 519, Criminal Procedure Code.	
2	From District Magistrate to Joint Magistrate.	1724; 5 May 1876 -	Giving certain instructions with reference to the above, and calling for explanation from the officers concerned.	
3	From Joint Magistrate to Tahsildar and Magistrate of Negapatam.	55; 5 May 1876 -	Asking him to explain why he did not prevent the burial.	Copy.
4	Petition from Sadagopa Ayengar to Collector and Magistrate.	5 May 1876 -	Complaining against the burial of Ubbasastri.	
	Endorsement thereon - -	19 May 1876 - -	Petition rejected for want of stamp.	
5	Petition from some inhabitants of Negapatam to District Magistrate.	6 May 1876 -	Requesting that the burial may not be interfered with.	
	Order thereon - - -	6 May 1876 - -	Expressing his opinion that it was incumbent on the Joint Magistrate to cause the speedy removal of the cause of danger.	
6	Notice from Joint Magistrate Seshappien, Village Magistrate.	6 May 1876 -	Informing that if the body is not removed before the 13th, he will be dealt with under Section 188, Indian Penal Code, and the body removed to Hathaway's Park.	Translation. Already sent up to Government with Letter, No. 2764, dated 22 July 1876. Copy.
7	Statement of objections from the sons of the deceased to the Joint Magistrate (by Vice President, Negapatam Municipality).	6 May 1876 -	Objection to the removal of the body.	(Enclosure 1, Vakalat)
	Joint Magistrate's endorsement thereon.	6 May 1876 -	Rejecting the above.	
8	From Joint Magistrate to the Vice President, Negapatam Municipality.	162; 6 May 1876 -	Informing that if the body be not removed by the sons it may be removed by the municipal servants to Hathaway's Park, or otherwise disposed of.	Copy.

List of Papers submitted to Government with District Magistrate's Letter, dated 15 August 1876, No. 3051.—*continued*

	From and to Whom.	Date and Number.	Subject.	Remarks.
9	From Joint Magistrate to the Inspector of Police.	50; 6 May 1876 -	Asking him to assist, if necessary, the Vice President of the municipality in removing the body.	Copy.
10	From the Zilla Surgeon, Negapatam, to the Sub-collector.	90; 7 May 1876 -	Giving his opinion that the burial would injuriously affect the water of the tank.	Copy already sent up to Government, with Letter, No. 2764, dated 22 July 1876.
11	From Seshappien to Joint Magistrate.	7 May 1876 -	Reporting the removal of the body.	
12	From Vice President, Negapatam Municipality, to Joint Magistrate.	36; 8 May 1876 -	Asking for a copy of the District Magistrate's letter on the subject.	Copy.
13	From Joint Magistrate to District Magistrate.	164; 8 May 1876 -	Reporting the removal of the body and the dismissal of the Village Magistrate, with some detailed information.	
14	From Joint Magistrate to Vice President.	167; 9 May 1876 -	Asking him to report about the truth or otherwise of the Village Magistrate's report that the body was removed.	Copy.
15	From the Sub-Collector to the Tahsildar of Negapatam.	610; 11 May 1876 -	Directing the dismissal of the Village Magistrate Seshappien.	Copy.
16	From the Tahsildar and Magistrate of Negapatam to Joint Magistrate.	36; 11 May 1876 -	Explaining his conduct in not preventing the burial.	Enclosure 1, English.
17	From the Town Magistrate, Negapatam, to Joint Magistrate.	112; 13 May 1876 -	Pointing out that the date is omitted in the notice* (to Seshappien to remove a certain wall) that accompanied Joint Magistrate's order,* No. 69, of 8th May.	* Enclosures 2.
18	From Joint Magistrate to Town Magistrate, Negapatam.	71; 15 May 1876 -	Rectifying the error above pointed out.	
19	From the Vice President, Negapatam Municipality, to the President, Negapatam Municipality.	52; 19 May 1876 -	Recommending the dismissal of the municipal servants that failed to give early information about the burial.	
20	From the Vice President, Negapatam Municipality, to the President, Negapatam Municipality.	54; 22 May 1876 -	Submitting the explanation of Beema Row, Municipal Overseer, about his conduct in connection with the burial case.	Enclosure 1.
21	From Town Magistrate to Joint Magistrate.	130; 6 June 1876 -	Requesting to know whether the Joint Magistrate has withdrawn his order about the removal of the wall as Seshappien states.	
22	From Joint Magistrate to Town Magistrate, Negapatam.	80; 8 June 1876 -	Asking that the enclosed two renewed notices† about the removal of the wall be served on the persons that put it up.	† Enclosures 2. Copies.
23	From the President, Municipal Commission, to the Vice President, Negapatam Municipality.	132; 17 June 1876 -	Asking him to obtain and submit explanations of the municipal servants about their conduct.	

List of Papers submitted to Government with District Magistrate's Letter, dated 15 August 1876, No. 3051—*continued*.

	From and to Whom.	Date and Number.	Subject.	Remarks.
24	From the Vice President, Negapatam Municipality, to the President, Negapatam Municipality.	78 ; 20 June 1876 -	Submitting certain explanation, and stating that no explanation was taken from the Registrar of Births and Deaths and the watchman, as their conduct is indefensible.	
25	From the District Magistrate to the Joint Magistrate.	2496 ; 1 July 1876 -	Asking for a copy of his order for the removal of the body.	
26	From Joint Magistrate to the District Magistrate.	231 ; 6 July 1876 -	Sending the above* with translation.*	* Enclosures 2.
27	From Town Magistrate, Negapatam, to the Joint Magistrate.	148 ; 11 July 1876 -	Reporting the removal of the wall.	Enclosure 1.
28	From the District Magistrate to Mr. Weld, Head Assistant Magistrate.	2693 ; 14 July 1876	Enclosing draft of his (District Magistrate's) reply to Government petition, and asking why Hathaway's Park was selected for the burial.	
29	From the Head Assistant Collector to the Collector.	185 ; 21 July 1876 -	Stating why Hathaway's Park was selected.	Copy already sent up to Government, with letter, No. 2815, dated 25 July 1876.
30	From the President, Municipal Commission, to the Vice President, Negapatam Municipality.	152 ; 27 July 1876 -	Sanctioning the dismissal of the municipal servants concerned.	
31	From the Collector to the Sub-Collector.	2891 ; 29 July 1876	Enclosing Government telegram† of 28th July, and asking for all papers connected with the burial case.	† Enclosure 1.
32	From the Collector to Mr. Weld, Head Assistant Collector.	2901 ; 31 July 1876	Asking for an answer to Government telegram above referred to.	
33	From the Collector to the Vice President, Negapatam Municipality.	2931 ; 2 Aug. 1876 -	Requiring certain information for replying to the Government Official Memorandum, No. 1163, dated 29th July 1876.	Copy.
34	From the Head Assistant Magistrate to the District Magistrate.	123 ; 3 Aug. 1876 -	Explaining what Hathaway's Park is.	
35	From the Collector to the Vice President, Negapatam Municipality.	2988 ; 8 Aug. 1876 -	Enclosing copy of Government telegram‡ of 4th August, and asking for an early reply to the questions referred to in Government Official Memorandum of 29th July.	‡ Enclosure 1.
36	From the Vice President, Negapatam Municipality, to the President, Negapatam Municipality.	109 ; 8 Aug. 1876 -	Replying to the questions asked in the Government Official Memorandum of 29th July.	

Vallam, 16 August 1876.

(signed) H. S. Thomas,
District Magistrate.

(True Copies.)

W. Hudleston,
Chief Secretary.

COPIES of the ENGLISH and ABSTRACT of the VERNACULAR RECORD in the
NEGAPATAM BURIAL CASE.

From *M. R. Weld*, Esq., Acting Joint Magistrate of Tanjore, to the District Magistrate of Tanjore, dated Negapatam, 4th May 1876, No. 160.

I HAVE the honour to inform you that this morning Mr. Oliver, the Vice President, Municipal Commission of Negapatam, came to me, and informed me that the body of a certain Brahman was buried on the bank of the Akarakolam, the principal source from which the people of Negapatam obtain drinking water.

2. When I went to the place I found the information to be true, and that the burial took place on Sunday afternoon. The body is buried within 50 feet of the water, between which and the grave is a flight of steps and a brick platform. In this sandy soil the impurities of the body cannot fail to percolate through and pollute the water; the steps can be no protection.

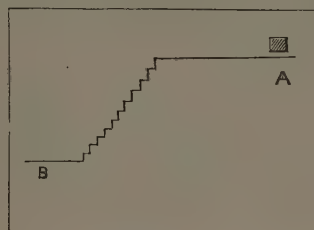
3. The deceased is the father of the village magistrate of Negapatam, and of the Collector's Sheristadar of North Arcot. His body was buried, not burnt, as he was a Saniyasi. The burial was secretly performed, and I never heard of it till to-day. The worst feature in the case is that Venkatroyalu Nayadu, the Tahsildar of Negapatam, was there countenancing the business, and it was doubtless chiefly owing to his influence that the matter was kept quiet.

4. When I visited the spot I told the village magistrate that the body must be removed, and that I should dismiss him. Since then another of the sons, the North Arcot Collector's Sheristadar, has been up begging me not to enforce the removal of the corpse. He, as well as the village magistrate, represent that it is customary to bury bodies round this bank, but when asked when this was last done they replied that the last instance was some 30 years ago.

5. I consider that the officials concerned, including the Tahsildar, should be severely punished.

6. This burial has been premeditated for the past month, and all things got ready; amongst the rest a wall has been built round the ground intended for the tomb, which, as far as I am at present informed, is an encroachment.

7. I consider that an injunction should be issued to the sons, the village magistrate of Negapatam, and one North Arcot Sheristadar, to remove the body within say a week under Section 519, Criminal Procedure Code, and that they be warned that if they disobey it the body will be removed and they will be prosecuted under Section 188, Indian Penal Code. Shall I do so?



A. Grave
B. Surface of Water.

From *H. S. Thomas*, Esq., District Magistrate of Tanjore, to the Acting Joint Magistrate of Tanjore, dated 5th May 1876, No. 1724.

I AM just in receipt of your letter, No. 160, dated 4th May 1876, and by the same train the North Arcot Collector's Sheristadar, who is the son of the deceased, has waited on me.

2. I cannot judge of the matter as you can, because I am not in possession of all the facts. For instance, the son states that it is a burial-place which has not been and cannot be closed except in due course under the Municipal Act; from your letter it is inferable, but it is not positively stated that this is not a fact.

3. If it be no burial-place there is no doubt that the body should be promptly removed. The son says it was buried with salt, which he was told was as much as 240 seers. If it was properly dispersed no harm may have yet ensued, but eventually decomposition must take place, and the percolation must naturally be in the direction of the water, which is the main drinking supply of the town of Negapatam.

4. If these premises then be so, I do not see how there is room to doubt that the burial must necessarily cause danger and annoyance to the persons who have occasion to use the public right of drinking the water of the Akarakolam, and that is the penal code definition of a public nuisance, and if these be the circumstances, I do not see why you should have delayed to do your duty where delay is dangerous; for if danger is to be averted it must

be by removal before decomposition, and this can be done by the sons under an order issued as you propose. Disobedience to such an order would in this case bring the disobedient under the heavier penalties of Section 188 in that the disobedience tends to cause danger to human life and health.

5. I do not understand how the wall can have been built so close to the Akarakolam without the knowledge of the municipality; the son says it was with their sanction a month ago.

6. If it be, as I gather from your letter, that this glaring offence against sanitation has been premeditatedly done and supported by the tahsildar, then it is only another case coming close after the former, of the sub-magistrate opposing the proper action of the municipality, and a term must be put to such antagonism. It has long been decided that this tahsildar should be compelled to retire, and the recent postponement of it must now be cancelled, and he should be told to give in his resignation immediately, for even if it were a burial-ground he must have known it was an outrageous offence against sanitation thus to poison the main source of drinking water for the town, and he should have informed you, and at least discouraged it till your mind was known.

7. The village magistrate also should be promptly dismissed.

8. Was the town sub-magistrate also quite ignorant of what was being done, and did the police know nothing, and were there not municipal officers who should have known and informed you earlier than they did?

9. Rule in Negapatam seems to be much disorganised.

From *M. R. Weld*, Esq., Acting Joint Magistrate of Tanjore, to the Tahsildar and Magistrate of Negapatam, dated 5th May 1876, No. 55.

Vernacular record.

ABSTRACT.—Intimating that it appears that he (the tahsildar) was present at the burial on the bank of the Akarakolam tank of the dead body of the father of Sashappa Iyen, the village munsif of Negapatam, who died after having become a Saniyasi; and directing the tahsildar to report if he were at the burial, why he did not prevent it, specifying the reasons for the same.

GENERAL REGISTER of PETITIONS presented to the Collector of Tanjore, 1876.

General Register Number.	FROM WHOM.		Date of Petition.	Purport.	FINAL ORDER.	
	From such and such Village in such a Subdivision.	Taluq.			Purport.	No.
1.	2.	3.	4.	5.	6.	7.
712	Sadagopayengar, residing at Negapatam, Perumal Covil-street.	Negapatam	5 May 1876	Requesting that orders may be issued for not allowing the corpse of Oopasasasthriar, father of the village Munsif of Negapatam, to remain where it is buried on the side of the tank, it being injurious to the health of the people.	Returned being un-stamped.	183

(signed) *H. S. Thomas*,
Collector.

To *H. S. Thomas*, Esq., District Magistrate of Tanjore.

The humble Memorial of the undersigned Inhabitants of Negapatam.

Most honoured Sir,

WITH due deference we beg to state that, on Sunday the 30th ultimo, a Hindu gentleman of 85 years of age, named Oopasasasthriar, of Negapatam, breathed his last. About two months previous he had entered upon the fourth and the holiest of the orders of life amongst the Saniyasis, technically known in the Hindu Sashtas as "Paramhansa asramam." His body, which became highly consecrated as it were under the above circumstances, was enshrined on the said day of his soul's sacred departure on the northern bank of the tank called "Akarakolam." The deceased having been a highly-educated Sastry in the Auchara, Prayashettar, and Carmacanda portions of the Hindu Vatas and Sashtas, and having been equally celebrated for his good and virtuous character, the procession to the burial-ground was largely attended by people of all classes of the local Hindu

Hindu community. The body was buried underground, nine feet deep, in the midst of a large quantity of salt thickly poured on all sides of it, as well as over and below it. This mode of burying the dead body is dictated by the Vadantic system of philosophy, with the apparent view of avoiding the corpse getting rotten below, and producing any result of a noxious nature. The Sashttras prescribe that bodies of worthy men of the kind should be interred in places to which the public resort for bathing, making ablutions, and for meditating, and it is no bad idea that arrangements to commemorate the names and recollections of eminent ancestors are made by giving a residence to their sacred bones near tanks, and by the side of pleasant running brooks. On the banks of the said Akarakolam, a custom of burying the dead bodies of all classes of Sannyasis has been long since prevailing even after the said tank was included within the Municipality. By way of proving such a fact a visitor can even this day meet with the small brick columns erected over the dead bodies in bygone years; over the tombs of some of these the tree called "Arasu" has been made to grow and is still growing with its wide and leafy branches. Moreover it is not a fashion obtaining in Negapatam alone, but it is the orthodox usage having force over the countries watered by the Thambrapurny, the Vigai, the Cauvery, the Ganges, and all the sacred rivers and tanks situated anywhere between Comorin and Himalayas. Under the highly rigid rules of Hinduism it is only one among ten thousands that is admitted into the rank of Sannyasi, and indeed it is to a very selected few of them honourable burial of the above sort is accorded by the community at large. Between the place where the interment has taken place and the limit of the water of the said tank when it could be quite full, there is about 50 feet of ground, and percolation is strongly guarded against by the existence of brick ghauts, constructed with long steps one over another, and reaching a depth of 30 feet. Percolation is further prevented by the foundation of a wall between the grave and the tank. The sloping of the ground on the side of the grave being also northward, there is not the slightest chance whatever of any contagion spreading underground to the water.

2. The remains being no more than a skeleton, in consequence of the deceased having been too much advanced in age, it is apt to be speedily consumed by the quantity of salt poured all around it, and there is no reason to be afraid of the interment sending forth any contaminating effects.

3. Under such circumstances your Honor's humble memorialists deeply regret to say that the Joint Magistrate of Negapatam, under the powers given him by Criminal Procedure Code, Section 519, has ordered the disinterment and removal of the said sacred person's body within a week.

4. Exhuming the sacred body is, according to our Sashttras, a sacrilege, and is strictly prohibited under the belief warranted by our Sashttras, that any disturbance to such interment has, we beg to submit, the effect of producing a fatal and evil consequence to the religious and social welfare of the Hindus. We, your Honor's memorialists, beg to submit, for your Honor's gracious and liberal consideration, that it is highly dangerous if executive officers, municipal or magisterial, were arbitrarily to decide questions of the above nature, and disturb by coercion the established current of religious doctrine over all the land of India, with its millions of people, and that without any inquiry or investigation. It is our humble belief that as Act III. of 1871, by Section 133, gives to Municipal Commissioners (whenever they deem it necessary) power only to prevent the formation of new burial-grounds, the interment under consideration having taken place in a locality where such things are used to be done is in no way contrary to the municipal law.

5. Further, it is admittedly true that the spot in question has been more than once utilised by the people for this purpose, even after the tank was brought within the municipality, and the fact of the municipal authorities having been silent on those occasions, is undoubtedly to be construed as a connivance at such a practice, and impliedly conveys an assurance that they have sanctioned the practice. Had they been dissatisfied with this custom, they should have prohibited the same, by adopting the procedure contemplated by Section 134 of the above Act, and the absence of such a procedure on their part takes this act away from the scope of public nuisance, and in consequence, the interment being once done is not a thing to be criminally noticed, the above section strictly requiring the evidence of competent persons being gone into as to the dangerousness of the burial-ground, and authorising upon due notice and deliberate consideration alone the closing of a burial-ground after satisfying themselves about the existence of another suitable burial-ground situated near enough. We are of opinion that even the proceedings of a magistrate exercising full powers regarding the burial-ground should be regulated by sound consideration of the reasons manifested in the above section of the Municipal Act, and should have a due regard to the religious feelings of the community.

6. In conclusion, we beg to approach your Honor with this memorial, with a request that a liberal and equitable consideration may be paid, and that an order may be issued to the effect that the interment under consideration may not be disturbed to the prejudice of the religious feelings of the Sivah and Smarta classes of the Hindus.

(signed) S. Chucrapany and 64 others.

From *M. R. Weld*, Esq., Acting Joint Magistrate of Tanjore, to the Village Magistrate of Negapatam, dated 6th May 1876.

Vernacular record.

ABSTRACT.—Directing the removal, within the night of the 13th instant, of the corpse of his father, which has been buried on the bank of Akarakolam tank, whose water is used for drinking purposes by the inhabitants, as the humours from the dead body would percolate into the tank, and produce disgust and sickness to the people; and informing him that if he fails to do as directed, he will be prosecuted under Section 188 of the Indian Penal Code, and that the corpse will be removed and buried in Hathaway's Park, or disposed of in any other way which may appear convenient.

Statement of Objections.

THE place where our father's remains have at present been interred is a locality which, from time immemorial, has been appropriated for the interment of Brahman Saniyasis and others. There is no other place in the municipality set apart for the same, nor has the municipality or magistracy ever expressed their disapprobation thereof by closing the ground or otherwise. No more than about three years ago there have been interments there of a similar nature, which have been tacitly allowed.

2. The way in which the body has been interred is such as not to cause any harm to the sanitation of the public, because as much as 10 kalums of salt have been carefully thrown round the body so as to eat up any impurities that it may cause.

3. The interment of the body is one of a strictly religious nature. The deceased was a Saniyasi, and a venerable old Brahman, of nearly 85 years, and such a halo of sanctity envelopes his tomb in the eyes of the public, that, should we be compelled to disturb it, it will be a grave sacrilege in the public opinion, not to speak of the extreme pain to our own feelings it will cause. This opinion of the public may lead to grave social harm to ourselves, which may even go the length of our excommunication from our caste.

4. We therefore beg that the honourable court, whatever it may think it judicious to order about matters of this sort in future, will be pleased to let this interment undisturbed in consideration of the foregoing circumstances.

(signed) *L. Saminada Pillay,*
T. K. Munusami, } Pleadors.

From *M. R. Weld*, Esq., Acting Joint Magistrate of Tanjore, to the Vice President of the Municipal Commission, Negapatam, dated Negapatam, 6th May 1876, No. 162.

I HAVE the honour to inform you that I have issued an order under 519, Criminal Procedure Code, for the removal of the body buried on the banks of the Akarakolam, warning the persons concerned that if it is not removed before Tuesday next, 9th, that it will be removed.

2. I therefore request that you will see that it is removed, and if it is not removed on Tuesday, that you will on that day have it removed by the municipal servants. It may be buried in Hathaway's garden, or disposed of as may be most convenient.

3. I have sent the enclosed order to the inspector of police. Why did not the tank kavulgars or some of the other municipal servants give earlier information of the burial?

From *M. R. Weld*, Esq., Acting Joint Magistrate of Tanjore, to the Inspector of Police, Negapatam, dated 6th May 1876, No. 50.

Vernacular record

ABSTRACT.—Directing him to be present and to assist the Vice-President of the Municipality, if requested by him, in removing the dead body of the father of Sashappa Iyen, the village Munsif of Negapatam, which has been buried on the bank of Akarakolam tank.

From Surgeon *L. Beech*, Acting Zillah Surgeon, Negapatam, to the Sub-collector of Tanjore, dated 7th May 1876, No. 90.

WITH reference to our conversation of 5th instant, I have the honour to inform you that I visited the Akarakolam in company with Mr. Oliver, the Vice President of the Municipal Commission, and it is my opinion that, notwithstanding there being a flight of steps which are between the tank and the grave of the deceased, organic and other decomposing matters must obtain entrance into the tank in question from the body of the Brahman, who was buried within 15 or 20 yards of the edge of the tank, and from the nature of the soil which is sandy, the percolation would be carried on under the most favourable conditions imaginable.

From *Sashappa Iyen*, Village Magistrate of Negapatam, to the Acting Joint Magistrate of Tanjore, dated 7th May 1876.

ABSTRACT.—Acknowledging the receipt of the order of the 6th instant, directing him to remove, within the 13th instant, the corpse of his father which had been buried on the bank of the Akarakolam tank at Negapatam. Reports that as he was informed that the joint magistrate wished at first to have the body removed within the 9th instant, he has this day, *i.e.*, the 7th instant, had it removed to the nunjah land, in the village of Jaggannathapuram and lying to the north of the above-said tank, which land he on the same day purchased and showed to the Vice President of the Municipality, and obtained a license from him and interred the dead body at that place. Vernacular record.

Representing that he is a poor man having a (large) family; that he has no other means of livelihood than his appointment; that he has already incurred large expense in the matter and sustained heavy loss; and that his conduct and ability would be evident if an inquiry be instituted. Requests that the joint magistrate will be mercifully pleased not to deprive him of his employment in any way.

From *F. Oliver*, Esq., Vice President of the Municipal Commission, Negapatam, to the Acting Joint Magistrate of Tanjore, dated Negapatam, 8th May 1876, No. 36.

I HAVE the honour to acknowledge your letter of the 6th May, No. 162.

2. The friends of the deceased person assured me that you allowed them time up to Saturday next to remove the corpse from the bank of the Akarakolam, and engaged to produce before me your written permission to that effect, but your letter under reply names Tuesday for the date I have to take notice of their default.

3. In the letter from the district magistrate on this subject which you kindly allowed me to peruse, there is more than one matter that the Commissioners should notice, and I shall be obliged by your sending me a copy if you see no objection to my request.

From *M. R. Weld*, Esq., Acting Joint Magistrate of Tanjore, to the District Magistrate of Tanjore, dated Camp Perellam, 8th May 1876, No. 164.

I HAVE the honour to reply to your letter of the 5th instant, No. 1724.

2. Even if the place where the Saniyasi has been buried were clearly shown to be a burial-ground, and even to be private property, it would be no reason for not issuing an order to remove the nuisance. Nuisances created by factories, &c., are, as a rule, on private property, but a man may not even use his private property to the detriment of the public health.

3. There is, however, nothing to support the contention that the place is a burial-ground except the vague assertion that some one was buried near the place some 30 years ago, and that a Sudra Saniyasi was buried on another part of the tank bank three or four years ago; but if the authorities were careless then it is no reason they should be so again; that fact that burials have been made round the tank at long intervals of time does not constitute the tank banks a burial-ground. It is entered in the Pimash as a Brahmans' bathing-place.

4. The wall was built with license from the municipality; the license permitted the erection of a wall, so as to make a place for Brahmans to bathe in, screened from the gaze of passers-by, provided he leaves it open to all desiring to use it. He built his wall, put a door to it, on which he put a padlock, and buried his father inside. I believe that

all through he was slowly preparing this place for his father's burial. The body was removed on Sunday, 7th; *vide* report of the village magistrate, which I enclose. I also enclose a letter from Dr. Beech on the subject, and the petition sent with your endorsement of the 6th instant, which directs me to return it.

5. I have directed Venkatroyalu Nayadu, the Tahsildar of Negapatam, to resign at once. I recommend that he be suspended at once, and his successor sent to take charge at Trivalore, that I may be able to go on with the Jumma bundy on the 15th.

6. I have also dismissed the village magistrate, as you say rule in Negapatam is quite disorganised. I recommend that the town sub-magistrate be sent back to the police; he has shown himself quite unfit for his post. Even if he is frightened into proper behaviour for the present he will relapse on the first opportunity. He is the chief cause of the disorganisation of authority. I am certain he knew all about the burial, but I cannot prove it.

7. The police inspector, going by an old G.O. of 1866, believed the Akarakolam to be beyond the limits, and never kept a watch there. He has been set right on this point. I may remark that he once wrote asking the Commissioners to inform him what are the municipal boundaries, but got no answer. Mr. Oliver and the Commissioners foolishly, as I think, considering it *infra dig* to correspond with him, it is to be regretted they did so, thus displaying themselves a fine instance of that spirit of obstructiveness and want of harmony of which they complain in others.

From *M. R. Weid*, Esq., Acting Joint Magistrate of Tanjore, to the Vice President of the Municipal Commission, Negapatam, dated Perellam, 9th May 1876, No. 167.

WITH reference to your letter, No. 36, dated 8th instant, I have the honour to inform you that Sashappa Iyen, village magistrate of Negapatam, sent up a report to me yesterday, stating that his deceased father's body was removed from the Akarakolam tank bank on Sunday the 7th instant, and buried in a place approved of by you, and to request you to let me know if this is true.

2. As requested by you, I herein enclose a copy of the district magistrate's letter, No. 1724, of 5th instant.

From the Acting Sub-collector of Tanjore, to the Tahsildar of Negapatam, dated 11th May 1876, No. 610.

Vernacular record.

ABSTRACT.—Informing him that Sashappa Iyen, the Village Munsif and Puttah Moniagar of Negapatam, has been, from the 6th instant, dismissed from his appointments on account of his having buried the dead body of his father close to the water of Akarakolam tank, which has been useful to many people for bathing and drinking purposes, so as to contaminate the water, while he is bound to prevent such acts on the part of others; and directing to strike off his name from the service register, and to recommend competent persons for the place, and send them to the Acting Sub-collector.

From *R. Venkatroyalu Nayadu*, Second-class Sub-Magistrate, Negapatam Taluq, to the Acting Joint Magistrate, Tanjore, dated Negapatam, 11th May 1876.

WITH reference to your Honor's Order, No. 55, dated 5th instant, calling upon me to explain my reasons as to why I did not prevent the burial of the Negapatam Village Munsif's deceased father (who took Saniasum and died) on the side of Akarakolam tank, if I had been to the spot on the occasion, I humbly beg to submit this explanation on the subject, fully trusting that it would meet with your Honor's approbation.

2. Just as the other inhabitants of Negapatam I was also informed, at about 2 p.m. on the 30th ultimo, that Voobasastrial, the father of the said Village Munsif, who took Saniasum, had died, that his body was being carried for interment, and that I should attend the ceremony.

3. The dead body, accompanied by about 2,000 inhabitants of Negapatam and with native music, &c., was brought to the northern side of the "Akarakolam," where it is customary to inter the bodies of Saniyasis who died at Negapatam. In conformity with the Hindu religion and custom, I went to the spot at 3 p.m. to reverence the dead body of the Brahman "Saniyasi" on the occasion of its burial. I saw a pit had been dug out for the interment of the deceased "Saniyasi," and also walls erected around the pit with
a gateway

a gateway and door. I was given to understand that the said walls have been erected under a license obtained from the municipality.

4. At the time of the interment in question about 2,000 inhabitants of Negapatam of all classes, such as Brahmans, Chetties, Soodras, &c., who use the water of the "Akarakolam" were presented at the spot; they did not raise any objection to the burial in question on the score that it would cause danger to the health of those who use the water of the said tank; it is customary to bury the bodies of "Saniyasis" who died at Negapatam on the western, northern, and eastern sides of the said tank; the interments of the deceased "Saniyasis" on those sides of the tank were not objected to at any time either by the people or by authorities; the grave had been dug and other preparations made for the interment before I went to the spot; it did not occur to my mind that the said interment would cause danger to the health of the people who use the water of that tank; for these reasons I did not prevent the burial in question.

5. It will be apparent from the fact of my having often complained to the sub-collector and to the municipal commissioners that the inhabitants of Negapatam are in great need of good water, and that some measures should be adopted to meet the demand; that I am a stern advocate of the welfare of the people of Negapatam, especially with regard to their water supply, and that I would have strongly objected to and stopped the interment of the said deceased Brahman "Saniyasi" if I had thought in the least that the same would produce injury to the health of those who have a right to the use of the water of the "Akarakolam."

6. Under the above circumstances, I humbly beg that your honour will be pleased to see that I was not in a position to prevent the burial in question.

From *M. R. Weld*, Esq., Acting Joint Magistrate of Tanjore, to the Sub-Magistrate of Negapatam Division, dated Negapatam, 8th May 1876, No. 69.

ABSTRACT.—Informing him that a notice is sent herewith, to be served upon Sashappa Vernacular record. Iyen, the village Munsif of Negapatam, enjoining him to pull down the stone wall which he has built on the northern bank of Akarakolam Tank, as it causes obstruction of way, and directing the sub-magistrate to get the notice served on the person named, and to report whether the wall is pulled down within the date specified in the notice.

From the 3rd-Class Magistrate of Negapatam Division, to the Acting Joint Magistrate of Tanjore, dated 13th May 1876, No. 112.

ABSTRACT.—States that he received the Order, dated 8th instant, No. 69, but that in the notice, which was sent by the joint magistrate, ordering the removal of the wall which Sashappa Iyen built on the northern bank of Akarakolam Tank, causing thereby inconvenience to the passers by, the date within which the wall should be pulled down has not been inserted, and that the Notice has, therefore, been returned, with the request that it may be sent back to him after having the date inserted.

From *M. R. Weld*, Esq., Acting Joint Magistrate of Tanjore, to the Village Munsif of Negapatam, dated 15th May 1876.

NOTICE.—Directing him to demolish the wall built by him on the northern bank of Akarakolam Tank, causing thereby obstruction of way both to men and cattle, and to remove the obstruction within the 25th instant; and informing him that if he is unable to execute the above order, he should appear before the joint magistrate in person at 12 o'clock on the 15th instant, and state the reasons for the same.

From *M. R. Weld*, Esq., Acting Joint Magistrate of Tanjore, to the Town Magistrate of Negapatam, dated 15th May 1876, No. 71.

ABSTRACT.—Returning the Notice, sent with his urzi, dated 13th instant, No. 112, Vernacular record. with the date inserted in it, and directing him to serve it if the wall has not yet been removed, but if the wall has been pulled down to return the notice unserved.

From *F. Oliver*, Esq., Vice President of the Municipal Commission, Negapatam, to the President of the Municipal Commission, Negapatam, dated Negapatam, 19th May 1876, No. 52.

THE Commissioners considered in their meeting the late burial of a corpse on the banks of the Akarakolam, and also had before them copy of the district magistrate's letter to the joint magistrate, No. 1724, dated 5th May 1876.

2. I am desired to note for your information the following facts :—

3. On the 3rd February 1876, one Iyasami Iyen applied for permission to build a wall and verandah on the bank of the Akarakolam "where the Brahmans bathe." This was reported upon by the inspector, and, after a full discussion at a meeting, the permission was granted on condition that it be open to the public. This permission to Iyasami Iyen was evidently appropriated by Sashappa Iyen, the municipal registrar of births and deaths, and he built a walled enclosure on the site, and buried his father there without asking or obtaining the Commissioners' permission; and here I am to state that Commissioner R. Venkatroyalu Nayadu was both present at the meeting and took part in the discussion when the permission to Iyasami Iyen was granted, and the Commissioners learn that he was also present at the funeral of Sashappa Iyen's father. The Commissioners hold their servants responsible—

1st. For the unauthorized erection of a walled enclosure not being detected and reported to them.

2nd. For neglecting to report the intended burial of a corpse on the tank bank.

3rd. For neglecting to make any report whatsoever of the burial, even after it had taken place.

It has been satisfactorily ascertained that Mr. Muir, the inspector, was absent from the town on duty when the walled inclosure was erected and the burial took place, he is therefore acquitted.

Beema Row, the sanitary overseer, in immediate charge of the division; Sashappa Iyen, the registrar of births and deaths; Alagan, the divisional peon, and the tank watchman, are all guilty of one or all of the three offences, and I have the honour to recommend their prompt dismissal at the desire of the Commissioners.

From *F. Oliver*, Esq., Vice President of the Municipal Commission, Negapatam, to the President of the Municipal Commission, Negapatam, dated Negapatam, 22nd May 1876, No. 54.

I HAVE the honour to forward herewith a petition presented by Beema Row, the sanitary overseer, for your perusal.

From *Beema Row*, Sanitary Inspector, to the Vice President of the Municipal Commission, Negapatam, dated Negapatam, 20th May 1876.

To my great surprise and sorrow I heard this day that at the last meeting your honour passed a resolution that I and some other municipal servants should be removed, on the ground of our not having given due information to your honour of the burial of a corpse on the Akarakolam Tank bank, to which I humbly beg to submit this explanation, with a view that your honour will be pleased to take it into your favourable consideration :—

2. On the day the burial took place, and on the following two days, I was so busily engaged in going through the streets to look to sanitary arrangements both morning and evening that I did not hear anything about the burial at all. On the noon of the 3rd instant, when I went out as usual, I learnt that there was a corpse buried on the tank bank, and I immediately went over to the spot and inspected it. Finding that such was the fact, I made an entry of that in my diary, and reported the matter to your honour that very evening. Consequently the delay in giving information to your honour, and not on account of carelessness on my part, was caused.

3. I have been holding my present post for the last four years, and on no occasion was I found fault with for neglect of duty or for connivance at any violation of the Municipal Act by the people of the town, and I have been throughout giving entire satisfaction to your honour. I beg to say that in this burial case I was perfectly innocent, and I could have had no motive in keeping the matter secret and thereby bringing ruin upon myself. Under these circumstances I humbly beg that your honour will be graciously pleased to take my pitiable case into favourable consideration and allow me to hold my post. I have got a large family to maintain, and I entirely depend upon the bare pay I now draw for my support.

From the Third-class Magistrate of Negapatam Division, to the Acting Joint Magistrate of Tanjore, dated 6th June 1876, No. 130.

ABSTRACT.—Reports that the notice, received with the order, dated 15th May last, No. 71, was, on the 16th of that month, served on Sashappa Iyen, the village Munsif of Negapatam, but that he had not yet pulled down the wall which he has built on the way to the Akarakolam Tank, although ten days have elapsed since the date specified in the notice for the demolition of the wall; and that when questioned, Sashappa Iyen has replied that the joint magistrate told him that he need not remove the wall; but that no intimation of the same has been given to the third-class magistrate. Vernacular record.

Prays, therefore, to be informed whether the joint magistrate has withdrawn his order to remove the wall.

From *M. R. Weld*, Esq., Acting Joint Magistrate of Tanjore, to the Sub-Magistrate of Negapatam Division, dated 8th June 1876, No. 80.

ABSTRACT.—Directing him to serve the notices herewith sent on Sashappa Iyen, the late village Munsif of Negapatam and on Iyasami Iyen, and to report in detail whether they have pulled down the wall built by them on the northern bank of Akarakolam Tank, so as to cause obstruction of way, within the date specified in the notices. Vernacular record.

NOTICE.

THE Acting Joint Magistrate of Tanjore hereby directs that Sashappa Iyen, the village Munsif of Negapatam, should remove, within the 14th instant, the wall which has been built by him on the northern side of Akarakolam Tank, causing thereby obstruction of way both to men and cattle; but that if he cannot carry out the above order, he shall appear before the joint magistrate at 12 o'clock on the 13th instant and report the same.

8 June 1876.

NOTICE.

THE Acting Joint Magistrate of Tanjore hereby directs Iyasami Iyen, residing at Negapatam, that as it has been reported to the joint magistrate that he (Iyasami Iyen) has raised a wall so as to cause obstruction to the way lying to the north of Akarakolam Tank and inconvenience to the men and cattle that pass by the way, he shall break down the wall and remove the obstruction within the 14th instant; but that if he cannot do so, he shall state the reasons for the same to the joint magistrate by appearing before him on the 13th instant at 12 o'clock, noon.

8 June 1876.

From *H. S. Thomas*, Esq., President of the Municipal Commission, Negapatam, to the Vice President of the Municipal Commission, Negapatam, dated Point Calimere, 17th June 1876, No. 132.

WITH reference to your letter dated 19th May 1876, No. 52, I have the honour to request you will be good enough to obtain and forward to me any explanation that the municipal servants referred to may have to give, with your remarks thereon, before I can sanction their dismissal.

From *F. Oliver*, Esq., Vice President of the Municipal Commission, Negapatam, to the President of the Municipal Commission, Negapatam, dated 20th June 1876, No. 78.

I HAVE the honour to acknowledge the receipt of your No. 132, dated 17th June 1876.

2. The explanation furnished by the overseer Beemah Row was forwarded on the 22nd May 1876, with my letter No. 54, and I have the honour now to enclose the explanation furnished by the Peon Alagappen. The registrar of births being the chief offender, I did not ask him for an explanation, as I consider his conduct and that of the watchman as indefensible.

From *Allagappen*, a Peon of the Municipality of Negapatam, to the Vice-President of the Municipal Commission, Negapatam, dated 27th May 1876.

STATES that he has served the municipality faithfully for the last ten years, during three of which he received no pay; that on a certain Sunday, a few days ago, he did duty up to twelve o'clock noon, and having obtained from his inspector leave of absence for the rest of the day, went to Nagore to be present at the celebration of a marriage in the house of one of his relatives; that when he returned to duty on the next morning he was told that the father of the village Munsif of Negapatam was dead, and that his body was buried on the bank of Akarakolam Tank by his relatives, in the presence of one of the municipal commissioners, the Tahsildar, and other native gentlemen; and that he did not report the occurrence, thinking no wrong had been done.

From *H. S. Thomas*, Esq., District Magistrate of Tanjore, to the Acting Joint Magistrate, Negapatam, dated Calimere Point, 1st July 1876, No. 2496.

I HAVE the honour to request you will be good enough to furnish me with a copy of the order issued by you to Sashappa Iyer and others for the removal of the corpse buried in the northern bank of the Akarakolam, to allow of my enclosing it in a report called for by Government.

From *M. R. Weld*, Esq., Acting Joint Magistrate of Tanjore, to the District Magistrate of Tanjore, dated Negapatam, 6th July 1876, No. 231.

WITH reference to your letter of the 1st instant, No. 2496, I have the honour to forward herewith a copy of the order (with a translation thereof in English) issued by me, under Section 519 of the Code of Criminal Procedure, to Sashappa Iyer, to remove the corpse buried in the northern bank of the Akarakolam at Negapatam.

Under Section 519, Criminal Procedure Code.

To *Sashappa Iyer*, Village Munsif of Negapatam.

WHEREAS you have buried the body of your deceased father on the Akarakolam Tank bank, which contains good water useful to the public at large for drinking purposes: And whereas the impurities of the body, by percolating through and polluting the water, will cause injury and sickness to those using the water; I do hereby direct and require you to remove the said body of your father before the night of Saturday, the 13th instant. If you do not remove it within that time, you will not only be prosecuted under Section 188, Indian Penal Code, but also the body will be removed by the Government and buried in the place called "Hathaway's Park," or will be disposed of in whatsoever manner it will be most convenient to do.

Negapatam, 6 May 1876.

(signed) *M. R. Weld*,
Acting Joint Magistrate.

From *T. S. Kistnasamy Chetty*, Third-class Magistrate of Negapatam Division, to the Acting Joint Magistrate of Tanjore, dated 11th July 1876, No. 148.

Vernacular record.

ABSTRACT.—Reports that the two notices received with the order dated 8th ultimo, No. 79, were, on the 12th of that month, served upon Sashappa Iyer and Iyavier, referred to therein, and that the wall constructed by them on the bank of the Akarakolam Tank has been completely demolished and the obstruction removed.

To the Negapatam Station Officer.

YOU are directed to serve the two notices herewith sent on Sashappa Iyer, the late village Munsif of Negapatam, and on Iyavier, residing at the same place, and to return this order, endorsing thereon the fact of the notices having been served upon the persons.

9 June 1876.

(signed) *T. S. Kistnasamy Chetty,*
Third-class Magistrate.

THE two notices referred to in this order have been served on the parties mentioned therein on the 12th instant.

12 June 1876.

(signed) _____,
Head Constable.

From *H. S. Thomas*, Esq., Collector of Tanjore, to the Head Assistant Collector, Tanjore, dated Calimere Point, 14th July 1876, No. 2693.

WITH reference to the enclosed Government petition, dated 5th ultimo, No. 1392, and my draft reply, both which please return, please put me in a position to explain the selection of Hathaway's Park as a place of interment, and offer any further remarks you wish. Why was Hathaway's Park preferred to other Hindu burial-places authorised by the municipality?

Please expedite your reply.

From *M. R. Weld*, Esq., Acting Head Assistant Collector, to the Collector of Tanjore, dated Tanjore, 21st July 1876, No. 185.

WITH reference to your letter of 14th July 1876, No. 2693, I have the honour to inform you that I stated in the order that if the body of the Saniyasi was not removed by the relatives, it would probably be buried in Hathaway's Park, because the vice president of the municipality, on being asked by me where the body could be buried, replied that there was no other waste ground at his disposal, and that if we were obliged to remove the body, that was the only place in which we could put it.

2. I was, as you have observed of yourself, very sorry for the sons, and suffered a great conflict of feeling when resisting their entreaties, and when pleaders Saminadiyar (late Government pleader) and Annasami Ayyar, old acquaintances of mine, came to speak about it, I consulted them as to the ceremonies and times at which they should be observed, and settled the time specified in the order in accordance with what they told me. I am sure that they will bear me out when I say that I did all I could to render the matter as little hurtful to the feelings of the family as was consistent with insisting on the removal of the body.

3. I return the enclosures.

From *H. S. Thomas*, Esq., Collector of Tanjore, to the Chief Secretary to Government, dated 25th July 1876, No. 2815.

IN continuation of my letter, No. 2764, dated 22nd July 1876, I have the honour to forward the inclosed, this day received from the head assistant magistrate, and to return the Government petition.

From *H. S. Thomas*, Esq., Collector of Tanjore, to the Vice President of the Municipal Commission, Negapatam, dated Point Calimere, 27th July 1876, No. 152.

I HAVE the honour to sanction the dismissal of the municipal servants referred to in your letters, Nos. 52 and 78, dated 19th May and 20th June 1876.

Telegram from the Chief Secretary to Government to the Collector of Tanjore, dated Ootacamund, 28th July 1876.

REPORT at once what is meant by Hathaway's Park at Negapatam, and what is it used for. Send at once Weld's report to you, and any other papers connected with case not already submitted.

From *H. S. Thomas, Esq.*, Collector of Tanjore, to the Sub-Collector, dated 29th July 1876, No. 2891.

WITH reference to the accompanying copy of telegram from Government, please send me all the papers in the case.

Copy to Mr. Weld, and of enclosure for information.

From *H. S. Thomas, Esq.*, Collector of Tanjore, to the Acting Head Assistant Collector, dated 31st July 1876, No. 2901.

WITH reference to the Government telegram which I have sent you, I shall be obliged if you can supply me with an answer for the papers I have asked the sub-collector.

From *H. S. Thomas, Esq.*, Collector of Tanjore, to the Vice President of the Municipal Commission, Negapatam, dated Point Calimere, 2nd August, 1876, No. 2931.

PLEASE put me, with the least possible delay, in a position to reply to the enclosed questions* of Government.

Copy to sub-collector for information, with copy of enclosure.

From *M. R. Weld, Esq.*, Acting Head Assistant Magistrate, to the District Magistrate of Tanjore, dated Tanjore, 3rd August 1876, No. 123.

IN reply to your letter, No. 2901, dated 31st ultimo, I have the honour to state that Hathaway's Park is a large piece of waste ground of which part, the south-east corner, next the salt creek, the Devanadi, is used as a place for burying night-soil; part, which is covered with a soil composed of old decomposed sweepings, is a garden; and part, the south-west corner, which is tolerably high, is not now used for any purpose; it was once, I believe, a salt-pan, and is now simply a piece of ordinary waste land separated by a valley from the place where the night-soil is buried, and from the garden.

2. As I have already informed you, I said in my order that if the body was not removed I might be obliged to bury it in Hathaway's Park, because Mr. Oliver told me that the municipality had no other piece of waste at their disposal. You will observe that I did not say I would certainly bury it there, but that I might be obliged to do so. This is all my words amount to. Had I been unable to find a better place, I should have been obliged to bury it there. I could not tell whether a better place was to be found till I tried, and I did not see the necessity of trying till I found myself obliged to exhume the body. It was as well to point out the worst that might happen if my order to exhume were not obeyed.

3. Had

* Official memorandum from Chief Secretary to Government to the Collector of Tanjore, dated Ootacamund, 29th July 1876, No. 1163.

With reference to his letter, dated 22nd July 1876, No. 2764, the Collector of Tanjore is requested to send replies to the following questions with the least possible delay:—

Has the Negapatam municipality prohibited burials on tank bund by any public order?

Is "Hathaway's Park" an established cemetery or burial ground?

Is it used as a place for depositing rubbish?

Have the municipality closed by order any and what burial grounds?

Have the municipality provided any new burial grounds for Brahmans?

(By order),
(signed) *W. Hudleston*, Chief Secretary.

3. Had I been obliged to exhume the body, I should certainly have consulted the Tahsildar and others as to how the business might be done, and where the body might be buried, so as to hurt the feelings of the relatives as little as possible. Because I, rather incautiously, mentioned Hathaway's Park in my order, it has been hinted to Government in the petition that I acted harshly and insolently, and so as to outrage the feelings of the relatives as much as possible. This is altogether the reverse of what I really did. I (as I have already stated) asked the Pleaders as to the times, &c., of the ceremonies, so that I might fix a time for the exhumation which would best suit the relatives, and I fixed the time according to what the Pleaders told me, after consulting the relatives. The Pleaders also told me that I would not have to exhume the body, as it would be exhumed by the relatives, so that actually, when I used the threat, I fully believed that I never would have to carry it out. They expressed themselves at the time grateful to me for the consideration shown them, but, Brahmin-like, they were ready to stab in the dark, and, seeing the advantage to be gained by my unguarded expression, have given the Government to understand that I acted with unfeeling insolence instead of with the fullest consideration compatible with enforcing my order.

Telegram from the Chief Secretary to Government, to the Collector of Tanjore, dated Ootacamund, 4th August 1876.

REPLY to memorandum of 29th July not yet received. Expedite despatch. Telegraph date.

From *H. S. Thomas, Esq.*, President of the Municipal Commission, Tanjore, to the Vice President of the Municipal Commission, Negapatam, dated 8th August 1876, No. 2988.

WITH reference to enclosed copy of telegram, please expedite the reply sought in my letter, No. 2931, dated 2nd August 1876.

From *F. Oliver, Esq.*, Vice President of the Municipal Commission, Negapatam, to the Collector of Tanjore, dated Negapatam, 8th August 1876, No. 109.

WITH reference to your letter, No. 2931, dated 2nd August 1876, I have the honour to reply to the questions of Government* as follows:

* See foot note, preceding page.

1. No, because the practice of burials on tank bund does not exist.
2. "Hathaway's Park" was a swamp, an abandoned salt vady, reclaimed by the municipality. It never was an established cemetery or burial-ground.
3. Yes, having been transferred to the municipality by Government for that purpose (G.O., Revenue Department, 8th December 1869, No. 3133).
4. The municipality have not closed any burial-grounds.
5. No Brahman burial or burning-grounds are situated within municipal limits. The only burning-ground used by Brahmans is situated just outside the town, near Toll-gate No. 2, Velipaliam, and there has never been any interference with it.

(True copies.)

W. Hudleston, Chief Secretary.

Judicial Department.—No. 5 of 1877.

From the Government of Madras to the Secretary of State for India.

My Lord Marquis,

IN the P.S. to our Despatch, dated 15th November 1876, No. 36, we mentioned that Mr. Thomas had just submitted a further letter of explanation which we would forward as soon as disposed of.

2. For this letter Mr. Thomas subsequently requested leave to substitute another which reached us on 12th January, and which we now transmit with the individual remarks of the Members of Government on it.

3. We see no reason to modify the decision in the case at which we originally arrived.

We have, &c.
(signed) *Buckingham and Chandos.*
Neville Chamberlain.
W. Robinson.
R. S. Ellis.

Fort St. George,
2 February 1877.

Government of Madras.—Judicial Department.—2nd February 1877, No. 285.

NEGAPATAM BURIAL CASE.

READ the following Papers:—

(No. 7.)

From *H. S. Thomas*, Esq., Acting District Magistrate of Tanjore, to the Chief Secretary to Government, Madras; dated Tanjore, 8th January 1877, No. 60.

IN their Order, No. 1585, dated 2nd September 1876, passed in the matter of a Sanyasi exhumation, the Government has censured me; I desire, therefore, to submit the following explanation in the hope that the Government may be pleased to remove that censure.

2. As the merits of my conduct are necessarily dependent on a just appreciation of the merits of the case in which I acted, and in which I stand condemned, I have no means of making a defence except by a representation of the whole case; and though this will involve the discussion of points on which the Government have already passed a judgment, points which might at first sight seem to be extraneous to my individual defence as a servant, still, I trust, it will be borne in mind that no point bearing on the merits of the case can properly be germane to the action taken thereon, or, consequently, to the explanation of the springs of that action. I entertain the hope, therefore, that, viewed in this light, a fair discussion of all the merits of the matter may be held to be no impropriety on my part.

3. I cannot hope to induce the Government to come to new conclusions, unless I can show that old premises are erroneous. I may be allowed, therefore, to sift those premises.

4. The first premise is an important one; it is seemingly the basis of the Order, the point from which the string of all the conclusions depends. I make bold to say that it is an erroneous premise, and to the proof of this I apply myself. I refer to the opening words of the Government Order: "It is clear that the place of interment was, and had been, a customary burial place for Brahmin and Sudra Sanyasis." I shall hope to make it clear that it was not so, and that the parties in the case, and the Government petitioner in particular, must have very well known that it was nothing of the sort.

5. In the papers which are referred to at the head of the Government Order as read, there are petitions from Krishnasawmy Aiyar, Head Sheristadar of North Arcot, dated 5th and 11th July 1876. Subsequent to the issue of the order of censure, I have seen one of these in the public prints, and find that this supposed fact, that the place of interment was, and had been, a customary burial place, this point at issue, is therein stated in very round terms as an indisputable fact, is strengthened by repetition, built up with all details about caste divisions, supported by plan, based on local knowledge of the best description, and, finally, assumed and argued on as admitted. The petition's opening statement on this head is that the "banks of the above tank are, from time immemorial, used as the burial ground," &c. "Time immemorial." It is an impressive statement certainly;

tainly; but it happens that the tank itself does not date from "time immemorial," neither do its banks, for they are of the same age as itself, being formed of the soil thrown up in its excavation from rice fields. The history of the tank is still within the grasp of memory, and a grandson and great grandson of the projector are living clerks now. About A.D. 1760, one Akkammal, a female lady's doctor, performed such kindly offices for the Dutch ladies that the Dutch Government dug for her the tank in question, and its proper name is not Akkaraikulam but Akkammal Kulam or Akkammal's reservoir. Thus passes away the implied Hindu religious origin, and the asserted immemorial usage of the European dug tank.

6. But without being drawn by the petition into looking at all the four sides of the large* reservoir as if they were one and the same piece of ground, it is better that I should keep strictly to the real point at issue, the place where the Sanyasi was actually interred. The real question is, was "the place of interment" "a customary burial place"?

7. It has already been distinctly stated in Mr. Weld's original report that the place of interment was "entered in the Pymaish as a Brahmin's bathing place." This, coupled with the fact that there was not even an assertion that there had been a burial there for 30 years was, I thought, sufficient and conclusive. All, therefore, that I said on this head was "The joint magistrates' report on this point is clear, and runs as follows:" and I quoted his two paragraphs, ending with the words "it is entered in the Pymaish as a Brahmin's bathing place." That the weight of the authority may be correctly appreciated, it seems necessary that I should explain, in some detail, the force of a Pymaish entry.

8. The Pymaish account is the Tamil, equivalent to the old Doomsday Book, with this difference, that in Tanjore the Pymaish account retains intact its original value. It was an account made here in Fasli 1238, answering to A.D. 1828-29, or 48 years ago. It was made on actual measurement, and all lands were entered consecutively, and each under a distinctive number; the entry describing minutely their dimensions, boundaries, and character. So minute was the Pymaish detail that even individual trees were ordinarily entered under their proper designations.

9. So particular was the Pymaish account in respect to the place of the Sanyasi's interment, that the extent is given as gulis 4 $\frac{5}{16}$ †, and the descriptive entry runs "the Brahmins' bathing place, steps, oratory, with a thatched roof, including the enclosure on the west." While it thus particularised down to the very nature of the roof, and was punctilious to a fraction, it cannot be possible that such a very prominent caste-fact as "a customary burial place" can have been omitted by oversight. On the contrary, it can only be held that the silence on this point is conclusive evidence against the place in question having been "a customary burial place."

‡ This means 15 of an acre.

10. The men who prepared these Pymaish accounts were, in those days, invariably Brahmins; to this day the Curnums or village accountants are almost, without exception, Brahmins. A Brahmin would have been specially careful not to omit the mention of a burial ground, even if there were the remotest vestige of a single Brahmin burial in it; for if it is a Brahmin burial, it must be the burial of either a child or a Sanyasi, and if the latter, it is the burial of a God, a more than saint, a veritable God, and it is a place of worship. Such a fact no Brahmin could possibly overlook. Here, then, is still further security, extraordinary security, that 48 years ago no Brahmin burial was there traceable either by eye or tradition. Up to 1828, at least, it neither "was" nor "had been a customary burial place for Brahmin Sanyasis."

11. That it was a Sudra burial place can still less be contended, for if it were we should not find a Brahmin anxious to be buried in it. It would be defilement. Neither should we find Brahmins bathing there. It would be defilement. Brahmin bathings, it must be remembered, are not made for the simple enjoyment of cleanliness, but are exercises of a strictly religious character, purifying ablutions performed prior to devotion and eating.

12. This Pymaish account is then conclusive evidence of the best nature on two points, —one that 48 years ago there was no knowledge that the place then was, or formerly had been, a burial place, still less "a customary burial place;" and the other, that it was not to be a burial place thereafter, for it was authoritatively set apart for other purposes, to wit, the bathing of Brahmins.

13. In

* The waterspread of the reservoir is roughly 900 feet long by 500 feet broad, say, 450,000 square feet.

† The reservoir with its banks included, covers about 928,800 square feet, 21 $\frac{1}{2}$ acres.

‡ 2. "Even if the place where the Sanyasi has been buried were clearly shown to be a burial ground, and even to be private property, it would be no reason for not issuing an order to remove the nuisance. Nuisances created by factories, &c., are, as a rule, on private property, but a man may not use even his private property to the detriment of the public health."

3. "There is, however, nothing to support the contention that the place is a burial ground, except the vague assertion that some one was buried near the place some 30 years ago, and that a Sudra Sanyasi was buried on another part of the tank bank three or four years ago; but if the authorities were careless, then it is no reason they should be so again; that fact that burials have been made round the tank at long intervals of time does not constitute the tank banks a burial ground. It is entered in the Pymaish as a Brahmin's bathing place."

13. In addition to all this, Mr. Weld gave me the assurance that, in point of fact, the spot had not been diverted from its proper use as a bathing place, that for 30 years, at least, it was known that there had been no burial there. I think it must be admitted that the evidence against its being "a customary burial place" was, as I have said, conclusive.

14. While Mr. Weld gave me this negative assurance, that for at least 30 years there had *not* been a burial in the spot in question, he made no admission that during the interval between the preparation of the Pymaish account and 30 years ago there *had* been a burial in that spot. The distinction should be carefully borne in mind. Mr. Weld's words were: "There is, however, nothing to support the contention that the place is a burial ground, except the vague assertion that some one was buried near the place some 30 years ago." "*Near the place*," it will be observed, not in the place; and I now find that the burial referred to was made in a perfectly distinct place, not "*the place of interment*," not Pymaish No. 297, but Pymaish No. 295, not in "the Brahmin's bathing place," but in a piece of private property.

15. To arrive at the truth in this matter, I must be allowed to keep strictly to the point at issue, and that point is "*the place of interment*," that and no other. The petitioner says it was a time-immemorial-used burial ground. I say that, on the contrary, it was a public Brahmins' bathing place, in which a burial would be the last thing permissible.

16. Pymaish numbers are distinct plots. They are called "numbers" because each distinct entry has its individual consecutive number, and by its number it is quoted and known and found in the account of the lands of that village; so that Pymaish No. 297 or 295 means, in simple English, lot No. 297 or 295 of that village.

17. Now, if 18 lots or plots of land were allotted in England, and utilised for various purposes, such, for instance, as a drinking reservoir, a theatre, and a church with churchyard, and so forth, would it be a fair deduction that the pantomine might be played in the church during service, or an interment made by the reservoir? Thus shown, the absurdity is apparent and preposterous. This, however, is just what the petitioner has done, and has claimed to have done rightly.

18. He, a Huzur Sheristadar, has treated all the 18 Pymaish numbers with which Akkammal reservoir is surrounded as if they were one and the same, as if they had no separate existence at all; has, as it suited him, taken the incidents of one, a private plot holding the remains of its owner, and applied these incidents to another, a public place, a place that had been explicitly set apart for a special purpose, Brahmins' bathing.

19. With equal truth and justice might he treat the rich sugar-cane of one Pymaish number and of one ryot as if it were the property of an adjoining possessor of another Pymaish number, and allow him to enjoy it. Does he deal thus promiscuously with Pymaish numbers when exercising his function as a Huzur Sheristadar? Most assuredly never.

20. With equal truth and justice might the mercantile premises of Messrs. Franck & Co. and the Banqueting Hall of the Governors of this Presidency be lumped together as if they were one and the same Pymaish number, and the attributes of one applied to the other, and that for the single reason that they are both on the sides of the Mount Road.

21. I trust to be pardoned the use of such startling parallels, because equally startling to me, as a revenue officer, is the spectacle of the first revenue subordinate of a district gravely asking the Government to believe a line of argument based on a complete ignoring of distinctive rights in separate holdings, and special revenue entry of such rights. Whether the plan which he has put in is equally promiscuous I am unable to say, as I am under the disadvantage of not having seen it. I annex in the margin, however, the Pymaish particulars of the 18 separate holdings of which the banks of the Akkammal reservoir are composed, and of which plot No. 297 is the place of interment,—the place at issue. The petitioner, however, speaks of them as if they were all one vast burial ground.

22. This Pymaish account, which shows that round this Akkammal reservoir there are 18 separate holdings, three Government property, nine private property, and six public property, set apart each for a specified purpose, this same

Pymaish account is well known to every revenue officer; it is relied on by every tahsildar, referred to by every revenue inspector, conformed to by every petty village accountant on 6 rupees a month; nay more, every intelligent ryot or landholder is thoroughly well aware that it is the basis of the security and identification of separate holdings. Is it credible that of all people in the world, the highly-paid head native revenue subordinate of a district alone knew nothing whatever of the existence of such an account? His

letter

PYMAISH DESIGNATION.

No.	PYMAISH DESIGNATION.
283.	Newly enclosed for flower garden of Saravana Chetti.
284.	Path.
285.	Flower garden of Velipalayam Siva Temple.
287.	Flower garden of Soundarajaswami Temple.
289.	Path.
290.	Flower garden of Kristnaswami Temple.
291.	Dry (<i>i.e.</i> , unirrigated) Government waste land.
292.	Path.
293.	Government dry cultivable.
294.	Flower garden.
295.	Government dry cultivable waste.
296.	Flower garden of Tuesday Temple.
297.	Brahmin bathing place.
298.	Lane.
299.	Way to north bathing place.
300.	Flower garden of Sattaiyappar Temple.
301.	Flower garden of Soundarajaperumal's Temple.
302.	Flower garden of Neelayataksheamman Temple.

letter ignores it. Or is it credible that knowing of it, it never occurred to him to examine it, or to ask a question about the tenure of the land in which he meant to bury his father?

23. But even after allowing such an impossible possibility, his own admissions, that he is "a native of Negapatam, that he has a house there, and that the whole of his family live in and about that place, that he himself had various appointments under Government in that town:" these present fresh difficulties to credence. I note also the intimate knowledge he claims to have about the said Akkammal's reservoir, and lastly, I add thereto the nature of the buildings on the spot,* and ask, Did it *look* like a burial ground, or was it an obvious bathing place? Is it credible that all this personal, family, and official residence in the town, aided by the features of the spot, gave petitioner no real knowledge about the chief and most frequented reservoir, of which he himself professes to have such a thorough and particular knowledge?

Paragraph 2 of his petition.

Paragraphs 5, 6, 7, of his petition.

24. I found, and still find, it hard to believe both these things; firstly, that, though his avocation was one which involved a special responsibility for, and constant conservancy with, revenue entries of holdings, nevertheless it never once occurred to him to make an inquiry about the tenure of the land in which he meant to bury his father; secondly, that all his local knowledge had left his mind a perfect blank wholly unimpressed with the daily blatant fact that the part he selected was a much frequented Brahmin bathing place.

25. Nay more, is it credible, thirdly, that, whatever might be his simplicity in these matters, it was no way disturbed when he found the chief revenue officers and the municipal vice-president, all in extreme opposition to his claims. Even if he were so very simple, that at any rate should have sufficed to arouse him to an examination of the correctness of his position, and then at least he must have known that he had made a mistake. But then it was, after all this it was, that he still deliberately sat down to pen his petition to Government.

26. What makes it still more hard to believe that he was in ignorance of the Pymaish entry is the singular coincidence that a few weeks before his father's death, a relation of his applying to the municipality for a portion of this very Pymaish number, applied for it in strict consonance with the Pymaish entry; applied for it not as a place for burial but as a bathing place.

27. He would have it believed that it was a mere coincidence that the person who made that application was a relative of his; and he implies that he himself was miles away in the North Arcot District. I am told, however, that he went to Negapatam during his father's lifetime and after the father was already known to be on his death-bed, and on consultation held with the Tahsildar and his own relations, and after considerable misgivings, and in eventual reliance on the local influence of the Tahsildar, he pre-arranged this very matter himself, and returning to his district left his brother and his relatives to carry it into execution.

Paragraph 7 of his petition.

28. He would have it believed that the enclosing was the work of "the Brahmin community" generally, and that his brother only "contributed like others." If so, and if it were really for a public bathing place for Brahmins, why was it locked up, and how came his brother to keep the key? My information is, that his brother bore the whole expense and supervision of the work. The reason for locking up was obvious; it was to conceal the fact that a grave was being dug the while inside the locked enclosure.

Paragraph 7 of his petition.

29. For this concealment there were cogent caste reasons. It was, of course, well known that a burial in that spot would be specially offensive to, and would be opposed by, other sections of Brahmins, as I shall explain hereafter; it was desired, therefore, to keep the fact, as long as possible, from the knowledge of the Vaishnavite Brahmins.

Paragraphs 36 to 45, *infra*.

30. They, however, got wind of it, and remonstrated with the Tahsildar as he was accompanying the procession to the burial. They entreated him to prevent it. In this way did the Tahsildar Venkatrayalu Naidu, the petitioner's brother Seshanpaiyar, who is village munsiff, and their friends know again that what they were doing was offensive to a section of the Brahmin community.

31. But even accepting the petitioner's own representation in his 7th paragraph, that it was "the Brahmin community" that was adapting the place for worship, how can he explain his straightway doing an act which would defeat that very object—an act which to a portion "of the Brahmin community" would most markedly defile the place, and render purity and worship impossible? Will he plead ignorance of such consequences? No Shaivite can pretend to ignorance of the fact that a burial ground is defilement to a Vaishnavite.

32. Furthermore, the spot was obtained from the Municipality under the two distinct provisoes

* Gulis 35-56/64 out of Gulis 45-24/64 are occupied by buildings and steps, and only Gulis 9-32/64, or 381 of an acre are left uncovered.

provisoes that it should be a bathing place, and that it should be open to the public, which, if it means anything, means that Vaishnavite Brahmins should not be excluded. There are Vaishnavites as well as Shaivites on the Municipal Commission, and they took care of this. With this distinct proviso staring him afresh in the face, the petitioner, nevertheless, put the place to an exactly opposite use.

33. Before the application for the bathing place was ever made, petitioner's father was on his death-bed and the inference is, that the whole matter was plotted from the very first.

34. Thus, I think, I have shown—

- I. That the place of interment *was not* and *had not* been a customary burial place.
- II. That the petitioner *well knew* it was not a customary burial place.

35. But I beg to submit a few words on the force of the special Aiyangar and general Vaishnavite objection to which the petitioner and his friends knew they were running counter when they stealthily dug a grave in the common bathing place.

36. The petitioner is a Shaivite. The religious views of the Shaivites and the Vaishnavites are in direct antagonism in the matter of Sanyasi burials, and of the Vaishnavites the Aiyangar section are in the strictest opposition.

37. To a Shaivite a Sanyasi is one who by holy living has attained divinity before death. He is a *presens Divus*, not a mere saint to be honoured, but a living deity upon earth, and as such he must be worshipped even in his lifetime; gifts must be given him, and adoring prostration of the eight members must be made by every true believer he meets; and when he dies, this worship should be continued over his grave. His tombstone should be a temple.

38. To a Vaishnavite, however, and especially to an Aiyangar, his burial place is as defiling as any other burial place. Their rule is "enter a Shaivite place of worship you must not, even though pursued by an elephant."

39. It follows that while a Shaivite can perform his ablutions and go to his worship of the dead Sanyasi, the Vaishnavite's ablutions are undone by the defilement of the burial place, and he must bathe afresh elsewhere before he can pass to his devotion and his meal. By a Vaishnavite, therefore, such a bathing place must be henceforward abandoned.

40. This very bathing place was, however, a specially important one to Vaishnavites, for once a year their God Perumal is brought there in solemn procession, carried very close by the place of interment, and there is no other road available, taken to the edge of the water, and set on the top of the steps under cover of a not inexpensive brick and mortar building. There he is worshipped by the Vaishnavite Brahmins, who there purify themselves before him, and eat before and worship him. In passage by, and in close proximity to, the defilement of a burial place all this would be impossible, for the Aiyangar chief priest of the principal Vishnu temple at Negapatam told him that it is forbidden for their God to go within 100 bow lengths (say 300 yards) of a burial place, because it would be defilement. He said they looked upon the burial in question as a studied pollution, and that it was a necessary consequence that the place of worship must be abandoned by Vaishnavites.

41. As a matter of fact, that was exactly what followed. As soon as the Aiyangars found that, in spite of their protest to the Tahsildar, the defilement of the spot had been accomplished by the Shaivites, they held a meeting in their temple, and came to the decision that it was necessary to abandon the annual procession and customary local worship of their God Perumal.

42. Furthermore, there is a holy fig or pepal tree (*Ficus religiosa*) on the spot enclosed for the burial of petitioner's father. To walk round and round such a tree is a devotional exercise common to Vaishnavites and Shaivites. The burial of a body close to it, almost touching it, introduced defilement to Vaishnavites, and consequently excluded them from the devotional use of the tree.

43. Thus the burial of a body in the place selected by the petitioner and his friends for the burial of his father necessarily involved the driving of the Vaishnavites from the common bathing place and the monopoly of it by Shaivites; necessarily involved the prevention of the annual Vaishnavite procession and worship of their God Perumal, substituting for it the temple and worship of the Sanyasi; necessarily involved also the driving of the Vaishnavites from the holy fig tree and the monopoly of it by the Shaivites.

44. All these necessary consequences must, as a matter of course, have been thoroughly foreseen by the petitioner, by the Tahsildar Venkatrayalu Naidu, by the Village Magistrate Seshappaiyar and their colleagues. It is obvious that it was on account of these very consequences that that particular place was selected, and the whole matter decided upon in conclave on the occasion of petitioner's earlier visit to Negapatam.

45. Furthermore, the Tahsildar was entreated about it on the very way to the burial, and told the entreater not to get himself a bad name, which from a native magistrate was
in

in native eyes suggestive of possibly getting into trouble. Be that, however, as it may, it was a deliberate continuance by the Tahsildar in the gross injustice of utilising his influence as a magistrate for the subversion of the religious liberties of others. He was a friend to the deceased, and though a Vaishnavite, he was, from being a Vadagalai, no friend to the Tengalai Aiyangars, with whom he had had an old feud. Hence, he had no objection to joining their opponents.

46. The Aiyangars are at Negapatam numerically weak in comparison with the Shaivites; nevertheless, it was openly avowed that but for the presence of the Tahsildar magistrate, they would, at all risks, themselves have disinterred the Sanyasi.

47. These very strong and, among Hindus, well-known religious objections* to the burial in question, considered in connection with the Pymaish arguments,† indicate a thorough previous knowledge of the very grave nature of the wrong deliberately done.

* Paragraphs 35-46.
† Paragraphs 8-34, and specially 15-34.

48. My defence now carries me to the next point in the Government Order:—the point that “no steps had been taken by any authority to prohibit such burials, or to prohibit the use of the place as a place of burial under the powers of the municipal or any other law.”

49. Now that the first premise has, I hope, been proved fallacious and removed, the answer here is simple. The municipality could not move under section 134, Act III. of 1871, because the place never was a public burial ground; all that the municipality could do, it did do. When it found the bathing place under its charge encroached on, it appealed to the magistrate.

50. The other places round the Akkammal reservoir, in which a few burials, twelve in six spots in all, have ever taken place are essentially private property. With them the municipality could not interfere.

51. Whether the magistracy could there interfere on sanitary grounds is an open question; for those burials are all much further removed from the reservoir, and the liability to percolation into the drinking water is by so much less. Moreover, they mostly took place at an age when sanitation was not regarded even by Europeans; at an age when the penal code was not.

52. Coming next to the contamination question, I may state briefly that while the Zillah surgeon mentioned the distance from the grave to the water, perhaps from pacing and memory, as 15 or 20 yards, and Mr. Weld gave it as within 50 feet, the exact measurement is now given me as 36 feet.

53. The Government Order relies on “a thick wall intervening.” I do not like to seem to contradict, even in my own defence, but it will be scarcely doing justice to Mr. Weld and myself if I do not markedly state the fact that the wall was not thick and did not intervene. Why should the wall be thick when it had not any superstructure to support, and was not high? As walls go, it was as thin as it could be. Also it did not intervene, for the enclosed plan will show that a straight line drawn from the corpse to the reservoir will pass well wide of the lowest foundations of the wall.

54. The “large flight of steps intervening” were also not such as to prevent percolation, for they lack not abundant interstices.

55. The medical officer, who is the local sanitary adviser of the magistracy, was of opinion that “the percolation would be carried on under the most favourable conditions imaginable.”

56. As it happened, Mr. Weld and I were both of the same opinion as the medical officer. But even if we had differed we should have had some hesitation, and incurred heavy responsibility in preferring our own unprofessional opinions. On a former occasion of very great emergency a sub-collector did so, because he had a Government Order also on his side. Yet how were he and I blamed for it?

Government Order, dated 10 August 1875, No. 286, Marine Department.

57. The Government says: “There can be no doubt also that any danger might have been entirely prevented without the removal of the corpse from the grave.” Had I known how this might be done, I should certainly have suggested it to the joint magistrate, Mr. Weld, for I was not then aware of the Vaishnavite objection. Even the petitioner admits that I discussed with him this last means of escaping the extreme measure of exhuming; and I might show that I did so in some detail, but that I fear to be wearisome; and I trust the Government will be satisfied that I did not fail carefully and thoughtfully to consider, to the best of my ability, how I could avoid pain to the relatives of the dead, while still doing my duty to the living.

His paragraph 12.

58. With reference to the Government objection to the use of “the utmost power of the law,” it is necessary to bear in mind that Mr. Weld and I were both fully persuaded that there lay on us the heaviest responsibility for the removal of the threatening cause of death to thousands. The petitioner had plainly told us that he would rather go to any expense than do this. It followed that no amount of fine would gain the necessary end. Nothing short of the prospect of rigorous imprisonment with magisterial removal of the body would ensure the end which we thought imperative. This is the reason why, in

paragraph 4 of my letter to Mr. Weld, No. 1724, dated 5th May 1876, this view of the position is set forth as it is. It should also be remembered, as explained in my former report, that it was the petitioner himself who had deliberately forced us into a position from which there can be no other retreat.

59. The Government Order censures me for having "omitted to institute a close examination." I venture to submit that the investigation I made was as thorough as was possible. I wrote to the responsible officer, and he referred me to the best evidence, the Pymaish account.

60. This Pymaish account is the basis of all our revenue work. To this do we go back in all questions. By this do the civil courts decree. When Mr. Weld reported to me that the place claimed as a burial ground was entered in the Pymaish as a Brahmin's bathing place, I felt that he had given me the most reliable evidence producible. I was satisfied, and I submit rightly satisfied.

61. The letter which I wrote was also penned by my own hand, though the number of letters that go in and out of this office in a single year is over 40,000, and in that letter I omitted no possible subject for inquiry. I venture to submit that I went into the matter very thoroughly, very carefully, very patiently also, and as considerately as possible.

62. This I did, too, under no slight provocation. For petitioner's interview was by no means a seemly one, as he had boisterously threatened me with the punishment of Government, and a riot that should overpower the police.

63. The tone of my comments on the facts of the case has been condemned. If they were ill expressed I can only regret it. What are the exact phrases to which objection is taken I do not know, or perhaps I might be able to explain that they were only a true reflection of the state of the case. For instance, I must still be allowed to maintain that the numerously signed Negapatam petition was not a representative one; and the Government will now doubtless recognise that I had very good grounds for looking at the matter from a very different aspect from that taken by Government.

64. I would beg the Government also to remember that I was hurried in this matter by frequent telegrams from Government, so much so that I was driven to submitting my office draft avowedly incomplete as it was, just to satisfy the Government that I was making no avoidable delay. Had I been allowed to retain my office draft till the inquiry was completed, I should have been able to recast it in some details, perhaps in some that have displeased the Government; but the tone of the Government telegrams was very pressing, and I had no option but to send off the unfinished draft with the explanation I did.

65. The Government is pleased to pass on me the following censure:—"His continued severity, however, in sanctioning the steps taken with regard to the municipal officers when he was aware that the case was under appeal to Government, appears not only to have been harsh in itself, but unjustifiable and ill-judged in the extreme, and the Governor in Council regrets to be obliged to record his marked condemnation of it." I beg to submit for consideration that I did not anticipate that the Government would take the view it has; that I thought I was properly serving the Government by continuing to do what I thought my duty till I was ordered otherwise. I thought myself in duty bound to complete my executive action. I thought that the Government would not wish its executive to be paralysed by every petitioner, but rather that its officers should pursue their duty to it, trusting in its continued confidence, till it expressed disapproval.

66. When I first came to this litigious district I found my subordinates paralysed in just such a fashion.

67. As soon as a complainant or accused in a criminal case found that the evidence was going against him, off he ran to me with a petition for transfer of the case to some other sub-magistrate, on the ground that he could not expect justice from the sub-magistrate trying the case, as he was venal or biassed. The sub-magistrate knowing from the petitioner that such a petition for transfer had been made to me, and not liking to proceed with the case under such a cloud over himself, stayed his proceedings, awaiting my orders on the petition for transfer. The consequence was, that not only was the sub-magistrate paralysed for a time, and his influence weakened by any petitioner who was sufficiently bold and vituperative, but the other parties, generally a number of innocent people, falsely accused criminally in what was really a civil matter, were kept awaiting the order from my distant court. I consequently issued the circular order, noted* below, by which sub-magistrates were directed to go straight forwardly on with their duty,

* No. 20, dated 16 December 1874. It has come to the knowledge of the district magistrate that parties expecting an unfavourable decision are constantly seeking a transfer of the case to another court, and that on hearing of such an application being made, sub-magistrates are in the habit of staying proceedings pending the order of the superior court. This is not right. The lower court should not be moved or stayed from the regular course of procedure by any such acts of the parties, and will be held responsible for improper delays thus allowed by it.

2. When the lower court itself sees cause for the transfer of the case from its own file, it will itself represent it to its superior court.

duty, quite irrespective of petitions to other courts, and this order I published in my District Gazette, so that petitioners might know that they must respect the local courts. I may add, that I also invariably refuse to transfer a case, because I would not cast such a slur on any court, except at its own request, and the petitioner's proper remedy is in appeal or review after the court of first instance has done with the case. This then being the rule which I laid down for my subordinates, it was also the rule which I had laid down for my own conduct as a subordinate to Government; and it never struck me that there was anything disrespectful, unjustifiable, or ill-judged in it; on the contrary, I thought I was thus best serving my masters and Queen.

68. But as the Government has markedly condemned such a principle of action as "unjustifiable and ill-judged in the extreme," my first impulse would be to obediently abandon it at once as regards myself, and, in every case of my knowing that a matter had been appealed to Government, to feel bound to stay my hand till I knew the Government pleasure. I am keenly sensible, too, of the heavy responsibility of not yielding this implicit and immediate obedience; and, perhaps, I should best serve myself by not incurring it. But I think I shall better serve the Government by seeking a re-consideration of the principle involved in this censure; and, as an old servant, I will, trusting in my past character, venture to take on me the risk of the submission; for if I did not, I fear that the administrative consequences would soon be very mischievous.

69. For instance, suppose I had felt tied down to await the orders of Government in the very case in point, the result would have been either a Vaishnavite riot for the removal of the body, or a body already so decomposed in the interim as to be past removal, and to be steadily percolating into the drinking water of the town. Cases in which delay would be similarly and even more fatal would be constantly occurring; and I think the Government would find it practically impossible to take the executive into its own hands.

70. But I await orders, and it is needless to say that whatever is the Government wish, that shall be loyally followed.

71. I come now to paragraph 5 of the Government Order. It has been duly reported in my letter, No. 3380, dated 15th September last, that the village munsiff was promptly reinstated, and the Government regrets communicated verbatim; that the bill for expenses was called for and passed by me, though it included even the cost of coming to see me on appeal, but that before it could be paid, the village munsiff bethought him that it would be degrading to receive it, and so the money remains unpaid. Having thus fully obeyed the orders of Government, even to the humbling of myself to being the mouthpiece of an apology to a village munsiff, who I felt all the while had been rightly dismissed for deceiving the Government officers, while it was his duty as a village magistrate to keep them informed; having thus fully obeyed, I think I may be allowed to submit the hope that, if the Government is now satisfied that he was a prominent actor in the plot laid by his brother the petitioner, and that his dismissal was therefore just, the Government will be pleased to order his re-dismissal.

72. The Government Order continues: "The municipal commissioners will, no doubt, act in regard to their dismissed servants in accordance with the spirit of this decision." This has been done. The law leaves dismissals and appointments to me as president; and though, in practice, I virtually leave them to the locally responsible vice-president, as his influence is dependent thereon, still as the Government wishes were concerned in this case, I took it on myself and ordered the re-appointments. The commissioners had nothing to do with it, and I judged it necessary not to consult them. Having here again gone out of my way to further the wishes of Government, perhaps the Government will be pleased to recognise that a municipality cannot work with wilfully disobedient servants. A valuable commissioner has since resigned in consequence.

73. The Government has desired (paragraph 7 of their Order) that this present matter may in no respect prejudice the case of the tahsildar. Now it has seen that it was the abuse of his authority that lay at the bottom of the whole matter, I hope it may think differently. But for his countenance it would never have been planned, but for his presence with the procession it could never have been carried out. He was the chief Native magistrate on the spot. To him the joint magistrate and I had a right to look for the maintenance of justice, yet he it is that set it aside. Not only did he err against sanitation in defence of which alone he should, I submit, have stayed the unsanitary burial, at least till the opinion of the joint magistrate or the municipality was known. He also deliberately set at naught the rights and religious feelings of the Vaishnavites. He also sanctioned by his presence an equally deliberate infringement of municipal authority over the land in question, which authority it was part of his duty as a magistrate to support. With reference to his case I beg a re-perusal of paragraphs 44, 45, 46 *supra*. If a tahsildar can thus set at naught sanitation, rights, religion, and authority, and yet be reinstated, in the face of his superior, that superior is paralysed, at least as regards his taluq, and all like-minded tahsildars are emboldened, and superior authority weakened.

74. In that my joint magistrate and I only serve the Government; anything that weakens our authority weakens the authority of Government itself. On this ground it is

that I am emboldened to hope the Government will think proper in its own interests to repair the breach that has been made therein.

75. Having thus submitted my explanation to the Order of Government, I will turn but briefly to the petition, for it does not seem necessary, though easy, that I should weary the Government by tediously dissecting seriatim all the many erroneous statements thereof. It may suffice in reference to the petitioner's 19th paragraph that I should submit, for the consideration of Government, that my magisterial conduct was not "hasty," not "inconsiderate," not "illegal," not "irregular," not "insulting," not "contemptuous," not "trifling in a high-handed manner with the rights of a large section of the Hindu community," but properly protecting those very rights from being high-handedly overridden. It may be allowed me to solicit the attention of Government to the fact that the man who has charged me with all these things is also a servant of Government. Perhaps the Government may think it necessary to take such notice of his conduct as will prevent a recurrence of the like reckless accusations in him or others.

76. The injury which the petitioner has succeeded in doing to my public character has been made as public as possible. It has been blazoned in every newspaper in all the three Presidencies, and has thence found its way into the public prints in England. It was not by me nor with my knowledge that the Government Order which censured me was made public, nor was it with the consent of Government. I know that a copy of the order of censure was in circulation among the Natives even before it was communicated to me by Government; and I know also that, before any part of it was officially made known by me, it was widely known throughout Negapatam, where the petitioner's brother and friends reside.

77. While seeking removal of censure, I desire to return my grateful thanks for the encomium with which the Government has been pleased to accompany it. On my acknowledged past character I have presumed to rely somewhat, and the pains I have taken to clear it from the present stain will show the value which I attach to its maintenance. That value is high, because the maintenance of an administrator's character means a continuance of the confidence of Government, and the public assurance of that lies at the root of his powers of usefulness. In these circumstances I count confidently on a patient hearing, lengthy as my defence unavoidably is.

(No. 8.)

MINUTE by the Hon. Sir *W. Robinson*, C.S.I., dated 19th November 1876.

AFTER a lapse of four months from the date of Government Order disposing of the Sanyasi burial matter, Mr. Thomas submits an explanation, in which contemporaneous fact and afterthought have become strangely confused. There are no new facts to be gathered amongst the mass of assertion and conjecture, and little that is fresh in argument is put forward.

2. It is impossible to follow this paper, paragraph by paragraph; but I may observe that I do not accept Mr. Thomas's conjecture as to the comparatively recent origin of the tank in question, although the Government Order says nothing of "immemorial." Be this as it may, I see nothing in Mr. Thomas's argument which negatives the fact that the tank-bank *passim* has been customarily used for the special sepulture of persons of the position of the deceased, as occasion arose.

3. Mr. Thomas attaches importance to the silence of the Pymaish (survey measurement of 1828-29) accounts as to this occasional use of the public portions of the tank-bank for such burials. The silence of the Pymaish account on such matters is natural, and in this case it is general; for the same silence pervades all the eighteen items of public and private lots set out in Mr. Thomas's letter; while obvious facts as to the use of parts of the bank *passim* for the purpose of such special burials, negatives absolutely the inference sought to be established from this silence. The fact is, the object—a revenue one—of the Pymaish account was wholly unconnected with the record of such casual usages as the one before us; their record would be out of place, and I should hold that the fact that the spot in question is described as being a public Brahmin bathing place or ghaut, rather favours than otherwise the contention that the spot in question has been used, as occasion arose, for the sacred and customary purpose alleged. Be this as it may, judicial inquiry upon this point was boldly challenged at the time, and was improperly avoided by the local officers. Government must not now be asked to accept Mr. Thomas's *ex post facto* estimate of one item of evidence which might have been put in and sifted at that inquiry, as sufficient explanation of grave neglect of the obvious duty of requiring careful judicial inquiry on this important point. But as an explanation of Mr. Thomas's ill-judged letter of the 5th May, the whole argument is out of place, for Mr. Thomas did not know of the Pymaish account until he received Mr. Weld's letter of the 8th idem. Neither of the inferences of paragraph 16, therefore, are sound. Silence of a revenue account does not qualify a practice which is proved *ab aliunde*; nor does the record that the spot in question

was

was used as a bathing place either alter, restrict, or interdict any local or occasional usage for other purposes; nor does such entry amount to a conveyance or setting apart of such spot for any special purpose to the exclusion of other usual purposes as Mr. Thomas seems to argue.

4. The argument that the subsequent perusal of this Pymaish account fulfilled that sufficient legal care and discretion which justified putting the utmost power of the law in force under the gravest coercion, simply shows that the executive Government is sometimes forced to repose confidence in indiscreet and hasty men.

5. I confess that I see no suitable name for the so-called "cogent caste reasons" put forward by Mr. Thomas, but *ad captandum* clap-trap; and we are asked to accept it without contemporary evidence or circumstantial confirmation of any kind whatever. Whatever the value of the claim put forward by Mr. Thomas in the Vaishnavite interest to equal participation in the use of the spot in question, the facts are that a Shaivite family got permission from the municipal commissioners—a mixed body—to erect a bathing place on the bank, which they shortly inclosed without remonstrance or complaint by the parties for whom the magistrate now appears as advocate. Shortly afterwards the public burial passed off in the presence of a Vaishnavite Tahsildar without petition or remonstrance from any contending party, and the continuous ceremonies of four or five days were proceeded with, without Vaishnavite complaint or interference; and to this day we have not in evidence, so far as I know, the scratch of a pen of complaint from that caste, as such, of caste grievance—unless the petition of a single Ayangar, presented without stamp, some five or six days after the burial and after Mr. Weld and Mr. Oliver had moved adversely to his rival caste man, is to be treated as such a remonstrance. But the abstract of the petition shows that no "cogent caste reasons," but sanitation only was the grievance of this one remonstrant. There is no contemporary evidence in support of the assertions contained in Mr. Thomas's letter against the tahsildar; and he is, after a lapse of six months' silence on the point, entitled, I think, to the benefit of any doubt even against the aspersions of the magistrate, uncorroborated as they are. The reasonable inference is that either the rival sect had no substantial interest in the matter such as Mr. Thomas now sets up on their behalf, or that they knew and acquiesced in the usage out of which this case has arisen. And I hold the latter by far the more probable inference. I see, therefore, no reason to doubt the soundness of the conclusion that the spot has been used for the purpose contended for as occasion arose from time to time with full caste approval.

6. I confess that I see no traces whatever in the contemporaneous circumstances of this case of "Special Ayangar and general Vaishnavite objection," alluded to by Mr. Thomas. His whole contention rests upon simple assertions of matter in respect to which there has been no evidence before us at any stage of the case, and in regard to which nothing occurs in either Mr. Thomas's or Mr. Weld's earlier letters. If, therefore, there be any present truth in the allegation, it seems to me to be *post facto* out-crop of that caste antagonism which is evoked by that grossly irregular conduct which the Government have already condemned. Be this as it may, the right and only reliable place for all this matter to appear was in the course of the investigation which was challenged at the time and refused; and Mr. Thomas is not the right person at this late period to find out for his own controversial purposes, caste rights and caste grievances which did not strike his clients at the proper time, and never have been officially advanced by them.

W. Robinson.

(No. 9.)

MINUTE by the Hon. R. S. Ellis, C.B., dated 28th November 1876.

I THINK Mr. Thomas should be informed that the Government have had under consideration his explanation, and that they see no reason to modify the Order against which Mr. Thomas appeals.

2. I have carefully read Mr. Thomas's explanation. It has in no respect altered the opinion which I have recorded on this case in my note of August last. I hold now, as I held then, that both Messrs. Thomas and Weld behaved in the matter of the exhumation of the body of a Brahmin Saniyasi (devotee) with the gravest indiscretion; that by their conduct they inflicted quite unnecessarily great pain and disgrace on a respectable Native family; and that their unreasonable and inconsiderate action in this case might have led to a most serious disturbance of the public peace.

3. It appears to me that, under these circumstances, it was the duty of the Government to repudiate the official acts of their servants, and to show their serious disapproval of their conduct.

4. The main acts which have been severely censured are, on the part of Mr. Weld,
265. F first,

first, the hasty order to exhume the body of a Saniyasi Brahmin who had been some days buried on the borders of a large tank, the borders of which had been customarily used for the burial of Saniyasis; and second, the aggravation of this intemperate and ill-judged order by the addition to it of the threat that unless the exhumation was speedily carried out by the relatives of the deceased, it would be done under the orders of the magistrate, and the body re-buried in a place generally known as the receptacle of the town-filth. So far as regards Mr. Weld.

5. Mr. Thomas has been severely censured, and, in my judgment, most deservedly, for not interposing his superior authority to prevent so grave a scandal as that which occurred at Negapatam.

6. The pretention advanced by Mr. Thomas that he has been condemned without being heard in defence, is unfounded. The petition presented by the inhabitants of Negapatam was referred to Mr. Thomas and Mr. Weld for their explanations, and it is on that petition and on those explanations that these officers have been judged and condemned.

7. In the explanation before Government, Mr. Thomas has devoted much time to showing that the place in which the Saniyasi was actually entombed was not a customary place of burial for Saniyasis; and to establish this point he describes the Pymaish or Native survey records in which the spot is entered as a Brahmin burial place. This is ingenious but beside the question, which was whether the borders of this tank had been customarily used for the burial of Saniyasis; and this Mr. Thomas is unable to deny. The Government never asserted that the actual site of the Sanyasi's interment had before been used for burying Saniyasis; what was asserted was that the tank-borders had been customarily so used, and that the municipality of Negapatam to whom, on the application to the Tanjore District of the municipal law, the tank had been transferred, had taken no steps to prohibit such burials. Mr. Thomas fails entirely to meet this statement. The entries in the Revenue survey accounts of portions of the borders of the tank as private property would not, according to Messrs. Thomas's and Weld's own views, have prevented the municipality prohibiting the use of private property to the injury of the public health if that idea had occurred to them.

8. The question as to how the interests of the Vaishnavite sect of Brahmins would be affected by the burial of a Shaivite Saniyasi at the Brahmin bathing places is a new issue raised by Mr. Thomas. But this like the whole of Mr. Thomas's explanation is beside the real question.

9. Both Messrs. Thomas and Weld have incurred the displeasure of Government by acting with imprudent harshness in exhuming the body of a man who was regarded with great reverence by the Hindu community, and Mr. Weld greatly aggravated his offence by adding a gross insult to this act of harshness. The grounds on which these officers affirmed that they had proceeded were distinctly sanitary, and it is neither candid nor useful to attempt to shift these grounds. Mr. Thomas's explanation now under notice, submitted long after the event, contains an elaborate disquisition as to the legality of the course pursued by the relatives of the Brahmin Saniyasi in burying him on the spot in question. These arguments would have been appropriate if Mr. Thomas had been dealing *ab initio* with an application to permit the burial of the Saniyasi in this particular spot; and I think that there would, on this question of title and on sanitary grounds, have been cause to refuse such burial.

10. But Mr. Thomas had to deal with the fact that the burial had taken place. I maintain that the proper and the only reasonable course was to have provided at the expense of those who had buried him in a place which might endanger the public safety, such precautions as would have reduced this danger to a minimum. The enclosure of the ground occupied by the body by masonry would have effected this, and such prohibition as was necessary to prevent future burials near the tank could have been issued.

11. It seems to me that it was as unnecessary as it was unwise to shock the public feelings, and to afflict a respectable Native family, by an exhumation which must have appeared a wanton outrage. It was a happy accident that this outrage on Native feeling passed off peaceably. The natives of Tanjore are not a turbulent race, but in many parts of India the indiscretion of Messrs. Thomas and Weld would most probably have caused a most serious disturbance of the peace. Under the circumstances of the case, what was required was consideration for Native feeling and ordinary prudence. Both these officers failed entirely in these essential qualities, and Mr. Weld went out of his way to add insult to injury.

12. I can find nothing in Mr. Thomas's explanation which, in my judgment, alters the view which Government have taken of the conduct of these officers.

R. S. Ellis.

(No. 10.)

MINUTE by His Excellency the Commander in Chief, dated 22nd January 1877.

The Negapatam Saniyasi Burial Case.

THE able review by Mr. Ellis of Mr. Thomas's appeal leaves me little to say.

2. As pertinently stated by my honourable colleague, the question at issue was not as to dealing with an application to permit a burial, but whether burial having taken place did Mr. Weld act with propriety and consideration, and was Mr. Thomas right in affording him his full support? If they were right, Government decided the case wrongly, and it would be our duty to admit our error and make amends to those officers. If Government was right, they were justly reprov'd, and Mr. Thomas's appeal should be dismissed.

3. The lengthy and strained argument now addressed by Mr. Thomas in explanation and in justification of the course pursued by Mr. Weld and himself ought not, however, under any circumstances to be now allowed to have the weight evidently claimed for it by him in order to prejudice the previous decision by Government.

4. Government had to come to a decision upon the information afforded to them, and if anything was then wanting for the full elucidation of the case, the blame rested with Mr. Thomas himself.

5. As regards the remark made in paragraph 64 of Mr. Thomas's appeal that "he was hurried by frequent telegrams from Government, &c., &c.," there is, in reply, the fact that the Saniyasi died and was buried on the 30th April, and that it was only towards the end of July that Government succeeded in obtaining from Mr. Thomas sufficient information to enable them to come to a decision on the case.

6. If conduct such as that practised by Mr. Weld and supported and justified by Mr. Thomas is to find support at the hands of Government, I do not see how we can expect to continue to govern India.

Neville Chamberlain.

(No. 11.)

MINUTE by His Grace the President, dated 25th January 1877.

MR. THOMAS'S explanatory statement received during my absence at Delhi has been so clearly reviewed by Mr. Ellis and my honourable colleagues that I do not think it necessary to offer any remarks upon it, except that it abundantly confirms the statement of Government as to the custom of burials upon the tank-bund, ignores the threat issued by Weld which was, in effect, to have the body removed to the common dunghill of the town, and which notice, moreover, and threat, were so headed as to make it appear that this outrageous threat was authorised by the law.

2. The suggestion that the first explanations were hurried is disposed of by a comparison of the date of the burial, the petition order and reply, in which reply, dated 22nd July, there is no suggestion of want of time to reply to the reference of 20th June.

3. It should also be noted in passing that the measurements of the grave from the tank, as stated in Government Order were based on the information forwarded by the collector himself to Government.

Buckingham and Chandos.

(No. 12.)

ORDER thereon, 2nd February 1877, No. 285.

MR. THOMAS will be informed that the Governor in Council sees no reason to modify his original decision.

2. Ordered that the above papers be forwarded for the consideration of the Secretary of State with the following Despatch:—

(True Extract.)

(signed) *W. Hudleston,*
Chief Secretary.

LETTER from Mr. *Weld* to the Under Secretary of State for India ; dated
20 February 1877.

4, Royal-terrace, Weymouth,
20 February 1877.

Sir,

I HAVE the honour to inform you that I was about to forward, through the Madras Government, an appeal against their order of the 2nd September 1876, censuring and punishing me for ordering the exhumation of a body which had been buried on the bank of the drinking water reservoir of the town of Negapatam, when I saw in the " Madras Mail " of the 20th ultimo a statement that the Secretary of State for India has called for the records of the case. If this is so it seems useless to send the appeal through the Madras Government, as it could not reach the Secretary of State till after the matter had been decided, but that it should be sent in direct for consideration with the records, if such a course is allowable.

I therefore have the honour to request that you will kindly inform me if the records have been sent for; and if so, if I may submit my Memorial direct, instead of through the Madras Government, for consideration with the records of the case.

I have, &c.
(signed) *M. R. Weld*,
Madras Civil Service.

LETTER from the Under Secretary of State for India to Mr. *Weld*.

Sir,

India Office, 7 March 1877.

I AM directed by the Marquis of Salisbury to acknowledge the receipt of your letter of the 20th February, asking permission to submit directly a Memorial against the decision of the Government of Madras in your case, as you understand that the records have been called for.

2. In reply, I am directed to inform you that the complete correspondence has not yet been received from the Government of Madras, but that, as it is expected to arrive by an early mail, the Marquis of Salisbury will permit you to send in your Memorial direct.

I am, &c.
(signed) *Louis Mallet*.

LETTER from Mr. *Weld* to the Secretary of State for India.

83, Abingdon-road, Kensington, W.,
8 March 1877.

My Lord,

I HAVE the honour to forward my Memorial direct, as permitted in the letter of the India Office of the 7th instant.

I regret that I have no certified copies of the documents forming Appendices F., H., K., and M. I have put in uncertified copies, which I had intended to ask the Madras Government to have examined and certified; but as this cannot now be done, and as the originals will be before your Lordship, I trust that this will not stand in the way of the Memorial being considered.

I am also unable to put in a copy of the last report of the district magistrate of Tanjore to the Government of Madras, sent in since the promulgation of the Government Order; I trust that it will be amongst the correspondence now coming from Madras, as I am anxious that it should be considered with the other papers.

The Secretary of State for India.

I have, &c.
(signed) *M. R. Weld*.

To the Right Honourable the Marquis of Salisbury, Secretary of State for India.

The humble Memorial of *Mathew Richard Weld*, of the Madras Civil Service.

Humbly sheweth,

THAT your Memorialist feels aggrieved by the enclosed order of the Madras Government, dated 2nd September 1876 (App. A.*), and desires to appeal against the same.

*See page 10.

2. Your Memorialist was assistant, and acting head assistant, to the collector and magistrate of Tanjore during the last five years, and was put in charge of the sub-division of that district, on or about the 28th of April 1876, as a temporary measure, on the death of the late Mr. Cameron, of the Madras Civil Service, pending the appointment of his successor. Shortly after the arrival of your Memorialist at Negapatam (the head quarters of the sub-division), early on the morning of the 4th of May 1876, Mr. Oliver, the vice-president of the Negapatam municipality, called and informed him that some four days previously, the village magistrate of Negapatam, one Sheshappayyan, had caused the corpse of his father to be buried on the bank of the Akkarri Kulam (tank), the principal, indeed almost the only, source from which the inhabitants of Negapatam obtain their drinking water, and which has been duly set apart for that purpose by the municipality, so that its defilement is a penal offence. Your Memorialist went to the place with Mr. Oliver, and found that a small court yard had been built on the tank bank, on looking over the wall of which he saw the grave. It appeared to him that the body had been buried so close to the water that, as it decomposed, organic impurities from it must find their way into the water, the more readily as the soil consists almost entirely of sand. The marginal sketch shows the position of the grave, distant from the water about 36 feet. Between the courtyard and the tank lay a brick platform, composed of bricks laid flat upon the surface of the ground, and a flight of steps; the walls of the courtyard, of brick in mud, with foundations less deep than the grave, did not interpose between the body and the water, so that there was nothing in the way of percolation except the flight of steps, of brick, not by any means solidly built, and little calculated to resist it.

3. Not willing to rely solely on the unprofessional opinions of himself and the vice-president, your Memorialist consulted the district surgeon, requesting him to inspect the place and give his opinion; this he did, at first verbally, subsequently in writing, a copy of his written certificate is enclosed (App. B.†), it is in accordance with the opinion of your Memorialist.

† Surgeon Beech to the Sub-collector of Tanjore, 7 May 1876, No. 90. Page 14.

4. As your Memorialist thought over the matter during the morning, before going to office, it occurred to him that as the body had been buried in salt (as he learnt) decomposition would be delayed (though not prevented), and there was, therefore, time to refer the matter for the orders of the district magistrate. He went to office resolved to do so. There he found awaiting him the Sheristedar of the North Arcot District, another son of the deceased, who prayed that the body might not be disturbed, and contended that the place where it had been buried was a customary burial place; but in support of this he could bring forward nothing but his own assertion that a corpse had been buried there some 30 years before. Your Memorialist informed him that he was about to refer the matter for the orders of the district magistrate, and that he had best apply to him.

5. That day (May 4th) your Memorialist wrote to the district magistrate (App. C.‡) reporting what had been done, and suggesting that an order be issued directing the removal of the corpse, and that the Government servants who had taken part in the objectionable burial should be punished. The principal of these were the tahsildar and subordinate magistrate (native) of Negapatam, who, instead of, as in duty bound, bringing the matter to notice, actually took part in the funeral, and the village magistrate, the son of the deceased. Next day the reply of the district magistrate arrived (App. D.§); he directed that the removal of the body should be ordered, if the place were not a customary burial ground, and that the Government servants concerned should be

‡ Mr. Welch to Mr. Thomas, 4 May 1877. See page 19.

Mr. Thomas to Mr. Weld, 5 May 1876. See page 19.

punished, and expressed some surprise that your Memorialist had not at once taken action. "If these be the circumstances," are his words, "I do not see why you should have delayed to do your duty where delay is dangerous." This letter, your Memorialist respectfully submits, amounts to a distinct order to have the corpse removed (unless he was prepared to report that the place was a customary burial ground, which he did not then and does not now believe to be the case), which order he was bound to obey, as the subordinate of the district magistrate.

6. In this letter the district magistrate also says, "I do not understand how the wall can have been built so close to the Akkarri Kulam without the knowledge of the municipality. The son (the North Arcot Sheristedar) says that it was "built with their sanction a month ago." This assertion of the Sheristedar is represented in his petition to Government; but the enclosed entry in the municipal proceedings book (App. E.*) shows that the persons who obtained license to build on the spot represented that they wished to build a covered ghât (flight of steps leading down to the water), and were permitted to do so on condition of their leaving it open to all who required to use it. Armed with this license, they built the wall, and under cover of the wall they dug the grave and got everything ready for the burial. There can be no reasonable doubt that they resorted to this deceit, because they were well aware that the Municipal Commissioners would not permit the burial of the body in that place.

7. After the receipt of the above-mentioned letter from the district magistrate, your Memorialist issued an order (App. F.†, translation of the same order), dated 6th May, directing the removal of the body within a week, and giving notice that if the order should not be obeyed the corpse would be removed and buried in a place called Hathaway's Park, or dealt with in any other manner which might be convenient. On the following day (7th May) the relatives removed the body and buried it in a garden, from the owner of which they obtained the site, not far from the first grave, but at a sufficient distance from the water.

8. The time allowed in this Order was sufficient for the parties to appeal to Government against it, but no such appeal was made; and the North Arcot Sheristedar actually takes credit to himself for having dissuaded his friends from doing so. Why, it is difficult to understand.

9. To the above-mentioned letter of the district magistrate, your Memorialist replied (App. G.‡) that there was nothing to support the contention that the place was a customary burial-ground, except the bare assertion of the parties interested that a body had been buried there some 30 years before.

10. Subsequently the Madras Government received a petition from certain inhabitants of Negapatam, relatives and friends of the deceased (App. H.§), complaining against the action taken by your Memorialist. This was sent for report to the district magistrate of Tanjore, who called upon your Memorialist to explain why he had selected Hathaway's Park as a place of interment in preference to any other Hindu burial-ground authorised by the municipality. To this your Memorialist replied, on the 21st July (App. I.||), explaining that he had mentioned Hathaway's Park, because the vice-president had informed him that it was the only waste land at his disposal in which the body could be buried. There is no such thing as a "Hindu burial-ground" in Negapatam, as Hindus do not bury, but burn their dead. In the case in question, the relatives wished to glorify the deceased as a Saniyasi (religious ascetic), and accordingly buried his remains instead of burning them.

11. The North Arcot Sheristedar subsequently petitioned Government on the subject; his petition (App. K.¶) was not sent for report, and your Memorialist only knows of its contents from its having been published in the Madras papers after the promulgation of the Order appealed against.

12. On the 22nd July, before the receipt of your Memorialist's letter of the 21st, the district magistrate sent in his report (App. L.***) on the petition of the inhabitants of Negapatam, in which he justified what had been done. On the 3rd August your Memorialist received a copy of a telegram from the Madras Government to the district magistrate, directing him to report what is meant

by

*See paragraph 3 of Mr. Oliver's letter to President of Municipal Commission, dated 19 May 1876, on page 26.

† See page 22.

‡ Mr. Weld to Mr. Thomas, 8 May 1876. See page 23.

§ Petition, dated 5 June, from S. Muthookisland, Iyer, and others. See page 3.

|| Mr. Weld to Mr. Thomas, 21 July 1876. See page 29.

¶ Petition from Kistnasamy Iyer, dated 11 July 1876. See page 5.

*** Mr. Thomas to the Government of Madras, 22 July 1876. See page 12.

by Hathaway's Park. Having by this time reverted to his post of head assistant, your Memorialist had returned to Tanjore, and was then very ill; this prevented his ascertaining and reporting accurately the details of the extent of Hathaway's Park, and the nature of the ground; but as it appeared that the Government demanded a report forthwith he wrote at once to the district magistrates (App. M.*) describing it, as well as he could, from memory. He has since ascertained that Mr. Oliver was right, that there is no other place to which he could have had the body removed had the relatives refused to obey his order, and had he then exhumed it; that the plot is over 30 acres in extent, and that, as he stated in that letter, though night-soil is buried in the south-east corner, the greater part is entirely free from anything that could be supposed to contaminate it. On the 15th August the district magistrate sent in a second report (App. N.†), enclosing your Memorialist's explanation.

*Mr. Weld to Mr. Thomas, 3 August 1876. See page 30.

†Mr. Thomas to Government of Madras, 15 August 1876. See page 15.

13. On the morning of the 5th September the district magistrate showed the Government Order to your Memorialist, who read it with the utmost astonishment and sorrow, as he was unaware that he had done anything deserving of censure, or that any such thing was pending. The Order of Government decides that the place where the body was buried is a customary burial ground, that your Memorialist acted hastily and without due inquiry, and that he wantonly insulted the feelings of the family of the deceased and outraged public decency by adding a certain threat to his order. This language shows that it has been assumed that the intimation that, if the order was not obeyed, your Memorialist would have the body removed to Hathaway's Park, is equivalent to a threat to bury it in the nightsoil. Against such an interpretation your Memorialist most emphatically protests, and submits that there is nothing to warrant it. He had not the slightest wish to hurt the feelings of anyone; on the contrary, he was anxious to do all he could to make his proceedings as little hurtful to their feelings as possible, consistently with obliging them to remove the body. He has always treated natives with whom he has been brought in contact with consideration and regard, and it is most painful to him to find himself accused of thus wantonly hurting the feelings of others from (as would appear from the Order of Government) a mere inhuman and diabolical love of inflicting pain. Had any such thing been the mainspring of his action, he could have gratified it by proceeding against the parties criminally under Section 277 of the Indian Penal Code, but he abstained from anything of this sort, and confined himself to enforcing the removal of the body.

14. Your Memorialist desires to draw attention to the following facts:—

(1.) Negapatam and the neighbourhood, in common with the rest of the Tanjore district, was at that time suffering from cholera. That epidemic, which has prevailed throughout the greater part of India since 1874, commenced there, and spread thence as from a centre. Government had repeatedly urged the Municipal Commissioners and the magistracy to use their utmost endeavours to check it. Your Memorialist was fully alive to the necessity of doing so, and his exertions to improve the sanitary state of his own division of the district (that of the head assistant) were mentioned with approval by the district magistrate in his report to the Board of Revenue. Your Memorialist had no personal interest in the matter, as his house was about two miles from the tank, and he did not use its water. He acted solely for the benefit of the people under his charge.

(2.) With reference to the assertion that the place is a customary burial-ground, it is not even pretended that anyone has been buried there for the last 30 years, and it is admitted that a Brahmin Saniyasi who died some 15 years ago, was buried in a different place. Supposing then that the assertion that a body was buried there some 30 years ago is true, does it follow that a burial there should be permitted now? Since that time attention has been directed to sanitation, the town has become a municipality, and the tank has been duly set apart as a drinking-water tank, so that its defilement is punishable under the Madras Towns Improvement Act.

(3.) The relations of the deceased showed by their conduct that they did not really believe that they had a right to bury the corpse in the place in question. They effected their object by deceitfully representing that they desired to erect a

covered ghât, and obtained a license to do so, under cover of which they were able to prepare the grave without their purpose being discovered.

(4.) Your Memorialist was moved to act by the vice-president of the municipality. The Sheristedar of North Arcot says in his petition that that officer promised, on the 4th of May, to see your Memorialist and waive all objections to the burial, but he never did so, and at all subsequent meetings he appeared to adhere to his original opinion.

(5.) Your Memorialist did not rely on his own opinion solely, but obtained the best he could for his guidance, that of the district surgeon; nor did he take any steps till he had obtained the instructions of the district magistrate, and he was, in fact, only obeying his superior in issuing the order to remove the body.

(6.) The body being buried in salt would not prevent, but only delay, decomposition. Indeed the salt would make matters worse in the end, and would assist the percolation of the impurities through the slight obstacle presented by the steps.

(7.) The intimation that the body might be buried in Hathaway Park does not amount to an indecent threat to bury it in the nightsoil pits. The friends of the deceased, in the hope of exciting indignation against your Memorialist, have represented the place as a sort of dung heap, where all the filth of the town is deposited, and their account appears to have been accepted as true by the Madras Government, but this is far from being so. The place is named after Mr. Hathaway, late of the Madras Civil Service, who, when sub-collector and joint magistrate of Tanjore and vice-president of the Negapatim municipality, obtained this piece of land for that body with the intention of making of it a public garden or park. It is over 30 acres in extent, and of considerable length from east to west. The surface being uneven, consisting of hills and hollows, and the soil of the hollows being impregnated with salt, owing to their being overflowed by the sea-water at high tide, and so unfit for cultivation, the town sweepings are used to fill them up to the level of the more elevated portions. The elevated portions, therefore, which occupy fully half the entire surface, have not even had sweepings thrown on them, and are free from anything that could be thought to contaminate them; one of these, some four or five acres in extent, lies in the south-west corner, surrounded on three sides by a valley, and having on the fourth the railway boundary hedge; this is entered in the old survey accounts (Painaish) part as a salt platform and part as a burning ground. It is no longer used for these purposes, as the salt depôt has been removed to another place, and the railway has cut it off from the main portion of the burning ground which is still in use. The nightsoil pits, which are in the south-east portion of the park, are very far away. This place would have afforded a perfectly unobjectionable site for the grave, and it is most unfair to your Memorialist to suppose that he would have passed over it to select a site in the objectionable south-east portion. As the vice-president told your Memorialist, there was no other Government waste land available to which your Memorialist could have had the body removed.

(8.) The order to remove the body was delivered to the village magistrate of Negapatam, one of the sons of the deceased, in the joint magistrates' court-room, he being then present with his pleaders, and had he or his friends felt aggrieved by the mention of Hathaway's Park in the order, there was nothing to prevent them saying so, and asking to have it omitted. That your Memorialist was far from wishing to insult or annoy them is shown by the fact that on their telling him that a week would be required for the performance of the ceremonies necessary on the removal of the body, he at once allowed that period in the order. They well knew that he wished to spare their feelings as much as possible, and at the conclusion of the proceedings, so far from complaining of anything in the order, they thanked him for the consideration shown them.

(9.) It was necessary that the parties concerned should clearly understand what would ensue if they did not themselves remove the body within the liberal time allowed, lest they should elect to endure punishment rather than obey, and perhaps frustrate, the object of your Memorialist by deferring the exhumation till it could be plausibly argued that decomposition must have already occurred, and that therefore it was useless to remove the body.

15. Your

15. Your Memorialist understands that the district magistrate has sent in a fresh report on the subject; he will request the Madras Government to attach a copy of it to this Memorial (as Appendix O.). He respectfully begs to draw attention to this and to Appendices L. and N., as they deal with the question most fully and ably, and show the opinions entertained on the subject by an experienced magistrate of about 22 years' service.

Mr. Thomas' letters to the Government of Madras, dated 22 July and 15 August 1876. See pages 12 and 15.

16. The delay in submitting this Memorial is due to ill-health. The very day your Memorialist received the Government order, he became so ill that he was sent home on medical certificate as soon as it was safe to remove him, and he has since been far from well.

17. The stigma cast on the character of your Memorialist by the order of the Madras Government, against which he now appeals, is most serious, and is likely to affect the whole of his future career. He therefore humbly begs your Lordship to annul the said order so as to remove the stigma from his character.

For which act of justice your Memorialist, as in duty bound, will ever pray.

41, South-street, Dorchester, Dorset, (signed) *M. R. Weld.*
15 February 1877.

From the Under-Secretary of State for India to Mr. Weld.

Sir,

India Office, 3 May 1877.

THE Secretary of State for India has had under his consideration in Council your letter dated the 8th of March, forwarding a Memorial addressed by you on the 15th of February to the Marquis of Salisbury, relative to the case of a Sanyasi who was exhumed by your orders at Negapatam. In reply, I am desired to inform you that Lord Salisbury has declined to interfere with the proceedings of the Madras Government with regard to this matter.

I am, &c.

To M. R. Weld, Esq.

(signed) *George Hamilton.*

From Mr. Thomas to the Secretary of State for India.

Bella Lucé, Guernsey, 13 April 1877.

THE humble Memorial of Henry Sullivan Thomas, Esq., of the Madras Civil Service, at present acting collector and magistrate of Tanjore, and absent from duty on three months' privilege leave.

2. Your Memorialist, feeling aggrieved by an order of the Madras Government, No. 1585, dated 2nd September 1876, passed in the matter of a Sanyasi exhumation, thought it necessary to appeal to your Lordship, but, trusting in the strength of his case, he did not doubt of convincing the Madras Government; and, rather than appear in conflict with his immediate superiors, wished that they should first have the opportunity of themselves rectifying their mistake without any necessity for your Lordship's intervention. He therefore submitted his explanation, No. 60, dated 8th January 1877, in the first place to the Madras Government. Now that the Madras Government has declined to be moved thereby, he appeals to your Lordship.

3. When your Memorialist left his post in India on the 2nd March, he was not aware that the Madras Government had passed any order on his letter of explanation, No. 60, dated 8th January 1877, and was patiently awaiting its communication to him in the usual way; but no copy, nor even the purport of the order having been given him, he has been unable to appeal earlier, and even now he is in no fair position for appealing, as he only knows verbally, and that accidentally, of the bare existence of an unfavourable order, and is in complete ignorance of its details. If the Madras Government has set forth any fresh reasons for its order, your Memorialist begs to be allowed to see them in order that he may clear himself, as he is confident he can. He therefore prays that your Lordship will be pleased to grant him a copy of the order of the Madras Government, and to delay decision thereon till his appeal is with all dispatch submitted.

4. If nothing fresh is brought forward in the last order of the Madras Government, your Memorialist will not trouble your Lordship with any addition to his letter, No. 60, dated 8th January 1877; for though much, very much, might be added thereto were it necessary, he trusts it is a sufficient exposition of the case. Relying on your Lordship's sense of justice, your Memorialist, as in duty bound, will ever pray.

(signed) *H. Thomas.*

From the Under Secretary of State for India to Mr. *Thomas.*

Sir,

India Office, 3 May 1877.

I AM directed to acknowledge the receipt of your Memorial, dated 13th April, in which you complain of the orders passed by the Government of Madras relative to the case of a Sanyasi who was exhumed at Negapatam.

2. In reply, I am desired to inform you that the Marquis of Salisbury has declined to interfere with the proceedings of the Madras Government in regard to this matter.

3. I am to add that the submission of your Memorial direct to the Secretary of State, instead of through the Government to which you are subordinate, was irregular.

To H. S. Thomas, Esq.

I am, &c.
(signed) *George Hamilton.*

EXTRACT from Minutes of a Meeting of the Council of India, held on Tuesday, the 24th April 1877:—

PRESENT:

THE MARQUIS OF SALISBURY, in the Chair.

Sir H. Rawlinson.
Mr. Cassels.
Hon. E. Drummond.
Sir Barrow Ellis.
Mr. R. S. Ellis.
Sir F. Halliday.
Sir H. Maine.

Sir R. Montgomery.
Sir W. Muir.
General Strachey.
Sir A. Wilde.
Sir G. Wolseley, and
Colonel Yule.

The Despatch to Madras in the Judicial Department.—Case of Mr. Weld, which was laid before Council on the 17th instant, was read. After a long discussion, the Question being put, "To approve the said Draft," the same passed in the affirmative.

Ayes, 7.

Sir H. Rawlinson.
Mr. R. S. Ellis.
Sir F. Halliday.
Sir R. Montgomery.
Sir W. Muir.
Sir A. Wilde.
Sir G. Wolseley.

Noes, 5.

Sir B. Ellis.
Sir H. Maine.
Mr. Cassels.
General Strachey.
Colonel Yule.

Whereupon the Draft was approved accordingly.

To His Excellency the Most Noble the Governor in Council, Fort St. George.

(Judicial—No. 4.)

My Lord Duke,

India Office, London, 26 April 1877.

Para. 1. THE Despatches of your Excellency in Council in the Financial Department, dated 28th September and 15th November, Nos. 28 and 36 of 1876, and

and in this department the 2nd of February, No. 5 of 1877, relative to the circumstances under which you have deemed it your duty to remove Mr. M. R. Weld, of the Civil Service, from his appointment of acting head assistant to the collector and magistrate of Tanjore, and to suspend him from all employment for a period of two months, have been considered by me in Council.

2. I have also received and considered in Council a Memorial addressed to me by Mr. Weld, who is now in England, protesting against the proceedings of your Excellency in Council in his case.

3. It appears that on the 30th April 1876 an aged Sanyasi died, and was, on the same day, in the presence of a very large concourse of people, buried on the north side of a tank, called Akkaraikulum, within the municipal limits of Negapatam.

4. On the 6th of May the acting joint magistrate, Mr. Weld, addressed an order to Seshappa Jyen, the village munsiff of Negapatam, a son of the deceased Sanyasi, directing him to exhume and remove his father's body, and informing him that if this order were not complied with on the 13th May, a prosecution, under Section 188 of the Penal Code, would be commenced against him. It was added, that the body would then be "removed on behalf of Government and buried in the place called Hathaway's Park." The village munsiff, Seshappa, was also dismissed from his post.

5. The justification alleged for these proceedings was, that the proximity of the spot in which the Sanyasi was buried to the tank would render the water liable to contamination, and that, therefore, on sanitary grounds it was necessary that the body should be at once removed.

6. The sanitary considerations appear to me exaggerated. The place of burial was from 15 to 20 yards distant from the tank, and was separated from it by a thick brick wall, and a large flight of steps; but it is not necessary to dwell upon this question; the real point for consideration is, whether Mr. Weld, when entertaining certain opinions on sanitary grounds, gave effect to those opinions in a proper and conciliatory manner.

7. I cannot think he did. He seems to me to have acted with great harshness. No attempt appears to have been made to induce the sons of the Sanyasi to render the grave impervious by the use of brick or concrete, or any other method. The exhumation of a body must always be repugnant to the religious feelings of natives, and, in the present case, Mr. Weld's order was addressed to the son of the deceased, a Brahmin Sanyasi, held in high respect for wisdom and piety, and was aggravated by the cruel threat that, if not removed by a certain date, the corpse would be taken up by direction of Government and buried in Hathaway's Park, a place in which rubbish was shot and nightsoil deposited.

8. It appears to me that in acting as he did, Mr. Weld altogether failed in that watchful regard for the religious feelings of the people which the English Government have traditionally exhibited, and which is one of the most essential qualifications of a civil servant.

9. I approve, then, of the proceedings of your Excellency in Council with respect to Mr. Weld; and I also concur in the condemnation of the tone of the comments of Mr. Thomas, the collector and magistrate of Tanjore, on the case. With respect to Mr. Weld, the censure with which his conduct has been visited will, probably, be sufficient to mark the views of your Government, and to impress on him the necessity of greater caution in the application of sanitary principles. Under these circumstances, your Grace in Council will, probably, be of opinion that the suspension of Mr. Weld from the exercise of magisterial functions need not be further continued.

I have, &c.
(signed) *Salisbury.*

DISSENT by MR. CASSELS.

24 April 1877.

I wish to place upon record my dissent from the despatch on this subject which, after much discussion, passed Council this day. It appears to me that the action of the Government of Madras in suspending Mr. Weld for two months, and in directing that the exercise of magisterial functions should be withheld from him, until powers should again be expressly conferred by order of Government, was not justified by the facts of the case; and that it is open to the charge of having been inspired by a wish to win popularity from the native population of the Presidency. I see reason to fear that the influence and authority of its own officers will be weakened by such action, and that the chasm which separates the European from the Native in India, will thereby be rendered even wider and deeper than it was before.

The Vice President of the Negapatam Municipality informed Mr. Weld that a burial had taken place in too close proximity to the tank from which the people of the town drew their drinking water. Mr. Weld visited the spot, and then consulted the surgeon in charge of the district as to the effect the decomposition of the body might be expected to have on the water, and the answer he received was that "organic and other decomposing matter must obtain entrance into the tank from the body." The distance of the grave from the tank is stated by Mr. Weld to be 36 feet. Mr. Weld, after receiving this confirmation of his fears, appealed to his superior officer the collector of the district, and he (Mr. Thomas) sanctioned his proposal that the body should be exhumed and removed to a greater distance from the tank. I fail to perceive how, with such advice and instructions before him, Mr. Weld could have done otherwise than insist upon the removal of the body.

It has been asserted that he acted harshly, and without due consideration for the feelings of the relations of the buried man. But I find no proof of this, and he affirms that the idea of wounding the feelings of the family never crossed his mind. The statements of Mr. Weld and of the relatives of the buried man are somewhat conflicting on several points of this part of the narrative, but I see no reason for disbelieving Mr. Weld and for placing reliance on the statement of the family. I cannot concur with those speakers in the discussion of to-day, who laid so much stress upon the necessity of respecting the feelings and religious customs of the people of India, and expressed alarm at the want of deference to those customs which they affirm to be manifested by English officers of the present time. If we ought to avoid all interference with the religious customs of the natives, how is it that we denounce, and to the best of our ability prevent, Suttee, which has been held to be a custom sanctioned by their religion? Where are we to draw the line between interference and non-interference? Mr. Weld had to think of the living as well as of the dead; the town was under his care; it had been, it is stated, a centre from which a wide-spread attack of cholera had sprung, and Government had repeatedly urged the municipal authorities to use their utmost endeavours to check the disease; I confess that in my opinion his conduct in the matter deserved commendation and not punishment. The introduction of sanitary reform has never been welcomed, nay, it has almost invariably been opposed by the natives of India, and it seems most undesirable to cast discouragement upon officers who, to the best of their ability, are striving to introduce reforms of this kind.

The Government of Madras state that abundant proof has been produced to show that the place where the body was interred was a customary place of burial; but I find no such proof in the papers that were attached to the despatch which passed Council this day; on the contrary, Mr. Weld asserts that there is nothing to show that any burial had taken place in the locality for 30 years. The final question resolves itself into this: Are the religious prejudices of the natives to be respected at the expense of the life of the community? There can, I submit, be but one reply to this, and in accordance with it, Mr. Weld must be supported. It seems to me that it was absolutely necessary to remove the body, and by doing so to impress upon the people the pernicious nature of the practice of interring dead bodies within a few yards of a tank from which they were in
the

the habit of drawing their drinking water. It may be added that the defilement of the tank was a penal offence.

It has been alleged that Mr. Weld gave additional offence by saying that, failing other arrangements, the body should be removed to Hathaway's Park; but it must be borne in mind that he was informed by Mr. Oliver, the Vice President of the Negapatam Municipality, that there was no other place to which he could have had the body removed.

I am, therefore, of opinion that, under all the circumstances of the case, Mr. Weld has been harshly treated, and that the action of the Government of Madras in suspending him from office is calculated to weaken everywhere the authority of their own officers, and to arrest the progress of sanitary reform in India.

I have, &c.
(signed) Andrew Cassels.

DISSENT by SIR H. S. MAINE.

From Despatch in Mr. Weld's case, passed by Council on Tuesday,
24th April 1877.

Mr. Weld, an acting Joint Magistrate in Southern India, issued an order about a year ago by which he directed that a body which had been surreptitiously buried on the margin of a tank near Negapatam should be exhumed, adding a statement of the consequences which would follow if these directions were disobeyed. The order was made under section 519 of the Code of Criminal Procedure, and there was nothing unusual in its form or *primâ facie* in its substance; but, for making it, Mr. Weld has been severely rebuked by the Madras Government, and was suspended from all public employment for two months.

There is a very heavy presumption against the justice of this censure and punishment. Negapatam is gloomily known to scientific medical authorities as a suspected cholera centre; that is, it is believed to be a place in which cholera is permanently present as an endemic, and from which it spreads from time to time, as an epidemic, over a great part of India, and possibly over a great part of the world. The tank in question is the principal, if not the only, source of drinking water to the population of Negapatam; and one fact among the very few established respecting the origin of cholera is, that it springs from the contamination of drinking water by decayed or degraded organic matter. Even, therefore, if we rate at the highest point of earnestness the desire of the dead man's relatives to bury him in this particular place, and even if we attach the utmost weight to their reluctance that the body should be removed, we seem at most to have a conflict between the interests of a large portion of mankind and the feelings of a single family of Hindoos, disposing of their dead in a manner never followed by the vast majority of their co-religionists.

An order for the exhumation of a dead body, so buried that it may defile a source of drinking water near a seed-bed of cholera, stands *primâ facie* in need of no defence, and the functionary who issued it may well have been actuated by a sense of duty more than usually high, and by a care for the interests confided to him more than ordinarily far-reaching and far-sighted. Very extraordinary circumstances of precipitation, or of violence, or of coarseness, must be proved and appealed to if the condemnation of such an act is to be justified. But, on the evidence before us, Mr. Weld seems to have fenced round his proceedings with an abundance, which might even be called a superfluity, of precautions. Within a few days after his assumption of his public functions, he was informed of the surreptitious burial by the Vice-Chairman of the Municipality, the "sanitary authority" of Negapatam. He convinced himself by ocular inspection that there was danger of defilement to the water of the tank; but, not satisfied with his own conclusion, he consulted the member of the official Medical Service who was the scientific expert of the district, and this gentleman confirmed his opinion. Still hesitating, he referred the case to the superior

above him, and received from that authority, not merely an expression of agreement with his view, but a strong remonstrance for not having sooner discharged an obvious duty. At last he issued the order; and the relatives of the deceased, who had already been informed that there would be time to appeal to higher authority against its being made, were now allowed the interval which they themselves desired for carrying it into effect.

The charge against Mr. Weld rests wholly on his having mentioned in his order a contingency which might not necessarily occur, and which, in point of fact, did not occur. After directing the relatives to remove the body, and pointing out the penalty which the Indian Penal Code imposed on disobedience, Mr. Weld, following, I presume, the ordinary form of orders like his, stated what would have to be done if, through the neglect of the relatives, the duty of removing the body should ultimately fall on the magistrate himself. He said that it would be buried in Hathaway's Park, an extensive piece of waste ground belonging to the Government. Hathaway's Park was in one respect the least appropriate, in another the most appropriate, place for the burial of a Hindoo, since in one part of it the refuse of the town was deposited, while in another part Hindoos, who follow the all but universal usage of burning, were accustomed to burn their dead. By a highly artificial construction of the language of his order, Mr. Weld has been taken to mean that he would bury the exhumed body in the first-mentioned portion of the waste ground. But the whole tenor of his proceedings seems to me to entitle him, if his language is the least doubtful, to the exactly opposite interpretation.

I do not believe that Mr. Weld, by his proceedings, shocked or outraged the religious feelings of any person whatsoever. The persons who effected the burial showed by the secrecy of their acts, and by the false pretences employed to cover them, that they were perfectly prepared for the consequences which would follow detection; and I largely share the suspicion that, if the authors of the surreptitious interment had not been deprived of their offices under Government, we should never have heard of the case at all. If, however, it were necessary to enter upon the question, it would be easy to show that hardly any considerable sanitary improvement can be carried out in India without in some degree offending the religious prepossessions of a community for almost all of whose practices, good or bad, there is a supposed religious sanction.

(signed) *H. S. Maine.*

27 April 1877.

I concur in the above dissent.

(signed) *Richard Strachey.*

7 May 1877.

DISSENT by SIR B. H. ELLIS.

I dissent from the tenour of the despatch which approves the proceedings of the Madras Government in the case of Mr. Weld.

2. Mr. Weld had unquestionably a difficult task to perform. On the one hand, no duty is more clearly laid down for the executive officers of the British Government than that they should respect the feelings, and even the prejudices, of the native population; on the other hand, the necessity for improved sanitation, and for the observance of precautions against the outbreak of epidemic disease, has been urgently pressed on the attention of all local authorities. I do not profess to decide whether, judging from the latter point of view, the urgency was such as to justify the extreme measures taken by Mr. Weld, at the risk of hurting the susceptibilities of a section of the native community of Negapatam. On the point whether the danger to the public from the possible contamination of the tank water and consequent spread of disease, was so clear as to justify the exhumation of the buried sanyási, the Madras Government must have better means of deciding than we have; and I do not presume to question their judgment.

3. But even if it be admitted that Messrs. Weld and Thomas were not justified

fied by the facts in the course they adopted, and that they also acted harshly in removing from their situations the Native Government servant for their share in the burial of the Sanyási, and for the deception by which it had been accomplished, I yet think that the circumstances did not warrant the severe punishment awarded to Mr. Weld.

4. I find that he acted throughout in accordance with the law, and with caution and deliberation. He justified himself by the formal opinion of his sanitary adviser; he referred for instructions to his immediate superior, and received from him an order on which he acted; he allowed the friends of the deceased ample time to carry out his injunction, or to appeal against it, if they felt disposed (which they did not); and, moreover, a sufficiently reasonable explanation has been given of the reference to Hathaway's Park, on which so much stress has been laid.

5. Mr. Weld, therefore, even if he be pronounced to have erred, erred from a too zealous desire to enforce sanitary precautions for the public benefit, and he certainly acted in good faith and with great caution. I must record my opinion that to visit so severely the action of an executive officer under such circumstances, tends to affect most seriously the efficiency of the administration; and it is especially from this consideration, and not merely in justice to Mr. Weld, that we ought to withhold our full approval of the proceedings of the Madras Government.

6. I think the proper course would have been to write to Madras and express the sympathy of the Secretary of State with the Madras Government in their anxiety to avoid wounding the feelings of any section of the native population, and his concurrence in the propriety of severely noticing any want of such consideration on the part of their officers, but I would have added, that the punishment awarded to Mr. Weld was, under the circumstances, unduly severe. A hope might have been then expressed that the censure already recorded would be considered sufficient, and that what has passed would not prevent Mr. Weld, on his return from leave, receiving such an appointment as his position in the service and his merits might otherwise entitle him to.

7. Had this been done, the past proceedings of the Madras Government would not have been unduly interfered with, but the Secretary of State would not have given the stamp of his approval to so severe a penalty as degradation and suspension from pay and allowances, which the Madras Government has in this case awarded to an officer who tried honestly to do his duty, and who acted, moreover, with care and caution, and with the sanction of his immediate superior, and in a manner which, though disapproved by the Madras Government and a majority of the Council here, is nevertheless approved by many authorities of eminence.

(signed) *B. H. Ellis.*

30 April 1877.

MINUTE by Mr. R. S. ELLIS, C. B.

I wish to make a few remarks on the case of Mr. Weld, who was temporarily suspended by the Madras Government. I desire to do this because I was a party to the order in question.

The exhumation of the body of a sanyasi (saint), held in great reverence by the Brahmins of Tanjore, had excited great indignation among his co-religionists, and if, as was asserted, there was no necessity for so unusual a proceeding, and if the order had been carried out with unusual harshness the magistrates concerned had committed an error of the most serious character. The Madras Government had therefore two questions to deal with in this case: 1. Was there such urgent necessity on sanitary grounds, as would justify the exhumation of the sanyasi? 2. Did Mr. Weld enforce his order with undue harshness?

After most careful inquiry and consideration the Madras Government decided, I still think rightly, that there was no urgent necessity for the exhumation.

The tank in question was not, as supposed, a reservoir of pure water for the supply

supply of the town. It was one of the ordinary tanks of an Indian town, from which hundreds not only take water for household purposes, but in which they bathe and wash their clothes, and which they defile in the many ways familiar to those who know Indian habits. It may easily be supposed in what an impure state such a tank would be. An isolated case of interment on its border could hardly add to its impurity. It was further ascertained that the body of this aged saint had been buried on the sloping border of the tank with unusual precautions. His grave was at a distance of 40 or 50 feet from the water's edge, the body had been surrounded with a mass of salt, and it was separated from the water by a brick wall and a flight of steps.

It was also in evidence that before the order of exhumation was enforced, the relatives of the deceased offered to take any further precautions, such as casing the grave with stone, pouring lime round the body, as might be considered necessary by the European officials. So that, the interment having taken place, matters might have been arranged in a manner which would completely obviate all risk to the public health.

This would have been reasonable, and the relatives of the deceased had a fair claim to this amount of consideration, for it was shown that the border of the tank had been used, at long intervals, as the recognised burial-place for this class of devotees. No effort had been made by the municipality to forbid such burials, so that the relatives of the deceased could hardly be charged with any wilful illegality in having publicly buried the sanyasi in the usual place.

The exhumation of a body, except for the purposes of justice, is always a serious matter, but in the present case more than usual care was necessary. The corpse was that of a well-known saint who shortly before his death entered the holiest order of ascetics, whose death and burial were events of great importance in the district. His funeral had been performed with more than usual ceremony, and in accordance with usage his resting place should have become a place of prayer and pious offerings. Under the circumstances nothing but the strongest sanitary necessity could justify the order of exhumation. As above stated, the Madras Government failed to perceive such necessity, and deemed it necessary to censure Messrs. Thomas and Weld for their want of consideration in a matter which was certain to affect painfully the religious feelings of the native community.

They had then to consider the manner in which the exhumation order had been carried out by Mr. Weld.

It appeared that Mr. Weld on first hearing that the sanyasi had been buried on the border of the tank, gave a hasty verbal order for his immediate exhumation, and dismissed the village magistrate (a son of the deceased sanyasi) for not having prevented the burial on the tank border.

Even after he had time for inquiry and reflection his conduct was unaccountably inconsiderate, for in issuing the formal written order of exhumation, he added the threat that if his order was not obeyed he would cause the body to be exhumed and placed in Hathaway's Park, a waste piece of land used as the place where the night-soil and rubbish of the town were thrown. These proceedings appeared to the Madras Government to be inexcusably harsh and inconsiderate.

Instead of doing all that was possible to mitigate the severity of the order of exhumation, Mr. Weld was violent and hasty, and used a threat which was a deliberate insult, not only to the relatives of the deceased, but to the whole Hindu community.

This conduct placed Mr. Weld in a different position from that of Mr. Thomas,* and the Madras Government thought it necessary to mark their displeasure by adding the punishment of a brief suspension to official censure.

2 May 1877.

(signed) *R. S. Ellis.*

* Mr. Thomas had nothing to do with the threat of Hathaway's Park.

MINUTE by the MARQUIS of SALISBURY.

THE Papers have left upon my mind a different impression of the case from that which they have left upon the minds of some of the members of Council; and as the questions at issue are not argued in the despatch, I think it will be better to put on record the reasons which in my view justify the course taken by the Government of Madras. There is a good deal of conflicting evidence as to the facts, but I state them as they appear to me, on reading the Papers, to have occurred.

There is a tank in the neighbourhood of the town of Negapatam, on the margin of which, for some generations back, Hindu saints have been buried, it being the practice not to burn the bodies of those who have attained to an extraordinary degree of sanctity, but to bury them by the side of tanks and rivers. The cases in which this honour is accorded are very rare, and therefore the number of such graves on the margin of this particular tank are few. Some such burials, however, have taken place in recent times, and one is spoken of which occurred only three or four years ago. No objection on the part of the authorities appears to have been made to the practice at that, or at any other time. Whether the interment was or was not technically illegal appears to be much disputed.

On the 30th of April last year, a Brahmin saint died at the age of eighty-five. One of his sons, who was a village magistrate in the neighbourhood, buried him the same day in the neighbourhood of the tank, in accordance with the custom above-mentioned. The funeral procession was accompanied with native music, and was attended by about 2,000 people, among them some of the Native municipal authorities, and the interment took place at four in the afternoon. It can hardly therefore be described surreptitious. Five days afterwards, Mr. Weld, the joint magistrate of Negapatam, having received information of what had taken place, sent for the son, dismissed him from his office, and (according to Mr. Weld's own statement to Mr. Oliver) threatened him that, unless the body was exhumed within three days, and buried somewhere else, it should be buried in Hathaway's Park. Hathaway's Park is a reclaimed swamp belonging to the municipality, where night-soil is buried, and rubbish is thrown. If I rightly understand Mr. Oliver's letter of the 8th of August, no part of this ground has been used as a place for the burning of the dead. Nor did Mr. Weld confine himself to threats. He gave a formal order to Mr. Oliver, Vice President of the Municipal Commission, that if the body was not removed within three days, the threat was to be carried out. At the same time, Mr. Weld dismissed two of the municipal officers who had been present at the funeral.

For these proceedings the Madras Government punished him. They also censured, without punishing, the Collector, Mr. Thomas, to whom Mr. Weld had on the first instance applied for instructions. The threat concerning Hathaway's Park was, however, not suggested in that application, so that Mr. Thomas was in no way responsible for it, and the facts of the case were not quite adequately represented to him. He only therefore incurred blame for having somewhat hastily sanctioned the harsh proceeding of dismissing the officers.

Mr. Weld undoubtedly was of opinion that the burial of the saint on the margin of the tank was likely to contaminate the water which the people of Negapatam used for drinking; and in this view he was supported by the opinion of Mr. Oliver and Dr. Beech, the local officer of health. The Government of Madras do not attach much importance to this danger, and if it is safe to form a judgment on such a point at this distance, I am disposed to agree with them. The grave was about 50 feet from the water; it was nine feet deep; it was situated on a slope which slanted away from the tank; and a flight of stone steps intervened between it and the water. It is also worth remembering that, guided apparently by some sacred rule of their own, the relatives of the deceased had filled his grave with nearly a quarter of a ton of salt. Moreover, the water in the tank was not pure, as we understand purity. The whole town of Negapatam were in the habit of bathing there, and, I believe of washing their clothes. Under these circumstances I cannot rate the danger of contamination very high.

But it is not necessary to insist upon this point. Mr. Weld is to be praised rather than blamed for having held very high sanitary doctrine. But the course

which he took was not necessary to his doctrine, however high. The sons of the deceased offered to bear any expense necessary for preventing contamination, rather than to suffer the disgrace and, according to their views, the sacrilege of exhuming their father's body.

The grave might, without the slightest difficulty, have been lined with masonry or concrete at the cost of the family, and all conceivable danger to the health of the inhabitants would have been at an end.

The heavy punishment inflicted, and the dishonouring threat uttered and half-executed by Mr. Weld, were not therefore necessary to the accomplishment of his sanitary objects. He states, indeed, that when he gave the order about burial in Hathaway's Park, he had in his mind a part of Hathaway's Park on which no night-soil or refuse had been thrown. The explanation is hardly an extenuation of his conduct; it implies that the necessity of respecting the religious feelings of the natives was so little present to his mind that the deadly insult which his words, according to their natural construction, were calculated to inflict, never occurred to him as a danger that was to be avoided.

The desire to amend the habits of the natives of India, in accordance with the latest results of European civilization, is, in the abstract, highly to be commended; but the object is sometimes pursued with a dangerous zeal. Without in the least depreciating the value of sanitary reforms, there are other considerations which it is even more urgent to remember, both for the welfare of the people themselves, and in the interests of our rule in India.

I cannot better express the nature of the apprehensions with which these occurrences inspire me than by quoting from the comments of two members of the Council of Madras, who know India well.

Mr. Ellis says :

“ It was a happy accident that this outrage on native feeling passed off peaceably. The natives of Tanjore are not a turbulent race, but in many parts of India the indiscretion of Messrs. Thomas and Weld would probably have caused a most serious disturbance of the peace.”

Sir Neville Chamberlain says :

“ If conduct such as that practised by Mr. Weld, and supported by Mr. Thomas, is to find support at the hands of Government, I do not see how we can expect to continue to govern India.”

4 May 1877.

(signed) *Salisbury.*

COPY of CORRESPONDENCE and PAPERS relating to the Suspension, in April 1876, of Mr. *Weld*, of the Madras Civil Service, for, as Magistrate of *Negapatam*, Tanjore District, causing the EXHUMATION of a BODY of a SANIYASI buried on the Banks of Drinking Water Reservoir at that Place, and all OPINIONS or DISSENTS of the Members of the Madras Council and Indian Council, if any.

(*Mr. Percy Wyndham.*)

Ordered, by The House of Commons, to be Printed,
14 June 1877.

[*Price 8 d.*]

265.

Under 5 oz.

